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AIR FORCE
THE MAGAZINE OF AMERICAN AIRPOWER

Volume 39, No. 4 • April 1956

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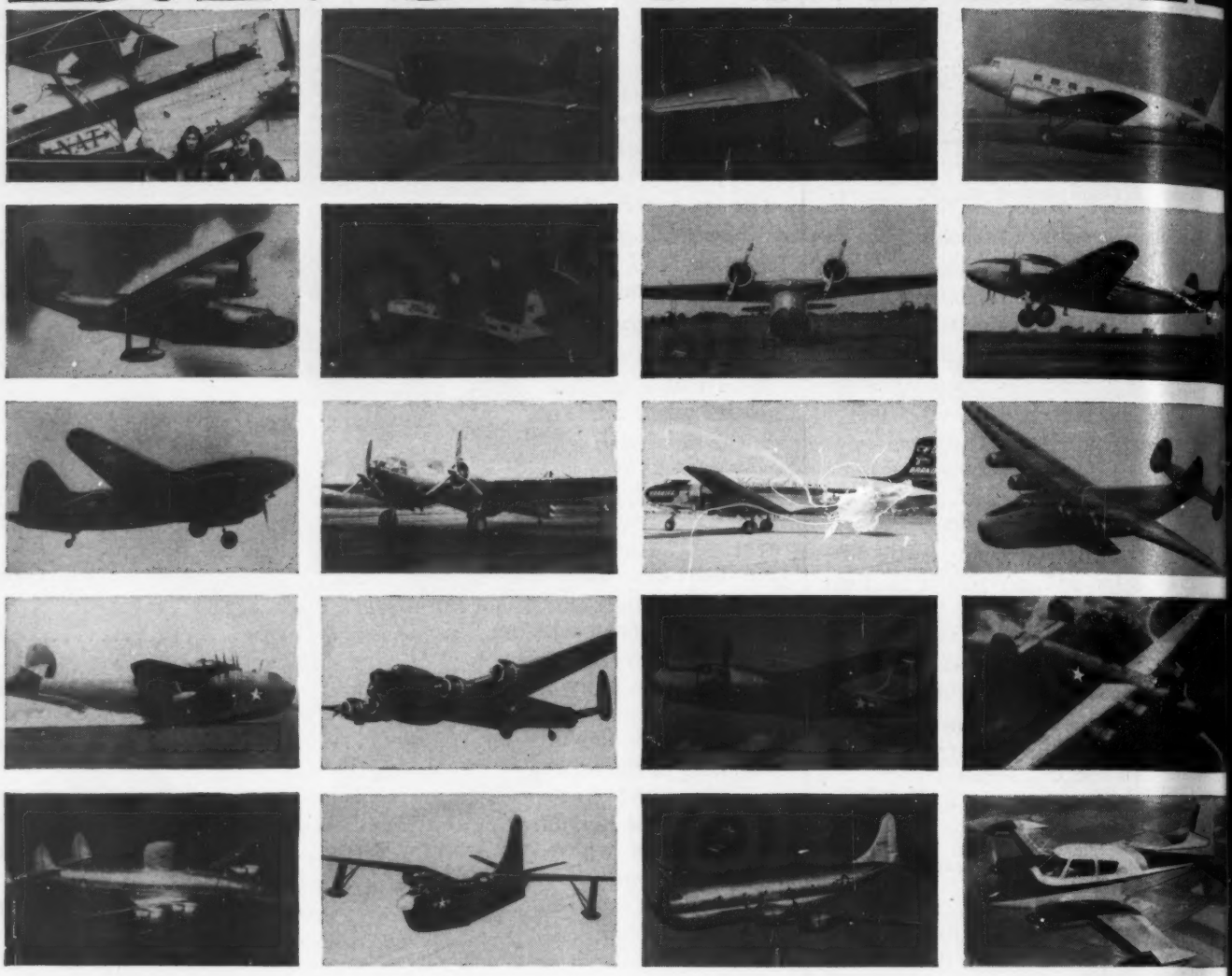
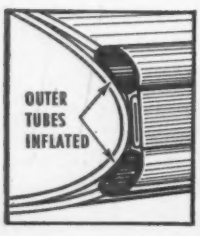
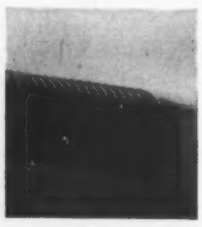


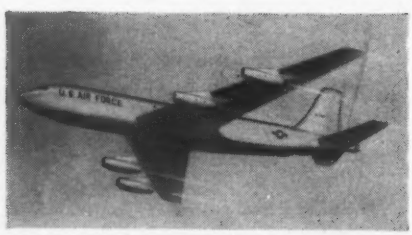
B. F. Goodrich De-Icers have
ice hazards than all other





1928 Dr. W. C. Geer and B. F. Goodrich engineers develop world's first ice protection—a rubber "boot" that inflates to crack ice off wing leading edges.

1955 Chordwise pneumatic De-Icers (right) on Lockheed Super Connies have latest design improvements that were developed for larger, faster planes—smaller tubes, electronic controls, quick-snap inflation cycles.



NOW Specification of B. F. Goodrich De-Icers for Boeing's KC-135 jet tanker unveils the newest development in ice protection—metal-clad, electrical De-Icers bonded to the metal leading edges of KC-135 stabilizers. This design-of-the-future is another example of the leadership in research and engineering that has kept B. F. Goodrich first in the fight against ice.

THEY'RE DEPENDABLE. Early styles B. F. Goodrich De-Icers that broke the ice barrier for commercial transports in 1930 are still in use today—in vastly improved design. Modern De-Icers—for larger, faster planes—have maintained the reputation for low weight and dependability in removing ice. For 20 years, B. F. Goodrich De-Icers have been the standard of ice protection for the aircraft industry—in name and in world-wide use.

Today's jet and turboprop aircraft demand complete ice protection systems

First in Rubber

protected more planes from systems combined! Here's why:

to safely meet the extreme conditions met in high altitudes and long distance flights. B. F. Goodrich is ready with these De-Icer systems—pneumatic, electric or a combination of both.

In addition, B. F. Goodrich offers such refinements as new streamlined chordwise De-Icer tubes, automatic inflation-cycle control and an ice detector that triggers the complete system automatically at the approach to icing conditions.

B. F. Goodrich also makes electrically-heated rubber for any place spot heat is required. If you have any ice protection problem, we're ready to help you. *The B. F. Goodrich Company, Tire & Equipment Division, Aeronautical Sales, Akron, Ohio.*

Pictured above; representative aircraft protected with B. F. Goodrich De-Icers (l. to r.): *Top row:* Douglas mail plane, Northrop Alpha, Douglas DC-1, DC-2, DC-3, Boeing 247, 307, Lockheed 10 Electra. *Second row:* Sikorsky S-43, S-44 Excalibur, Grumman JRF-1, Lockheed Lodestar, Martin PBM-3, Douglas B-23, Martin B-10B, Beech 18. *Third row:* Curtiss C-46, Martin 167, Douglas DC-4, Boeing 314, Lockheed Hudson, Martin B-26, Boeing B-17, Douglas C-54. *Fourth row:* Martin 170 Mars, Avro Lancaster, Douglas A-26, Consolidated B-24, Douglas C-47, Boeing B-29, Chance Vought F-4-U, Douglas AD-4. *Fifth row:* Lockheed RC-121, Martin P5M-1, Boeing C-97, Cessna 310, Lockheed F-94-C, Lockheed 1049-G, Bell 47, Beech C50.

B.F.Goodrich

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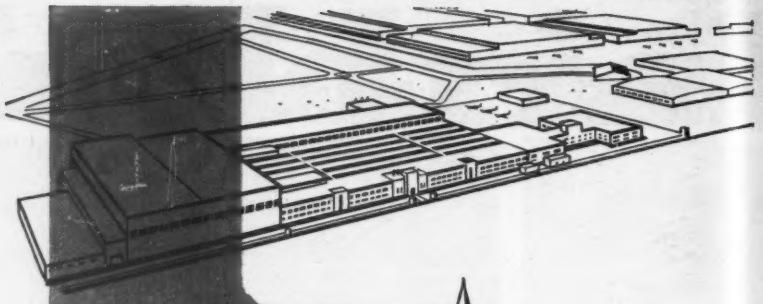
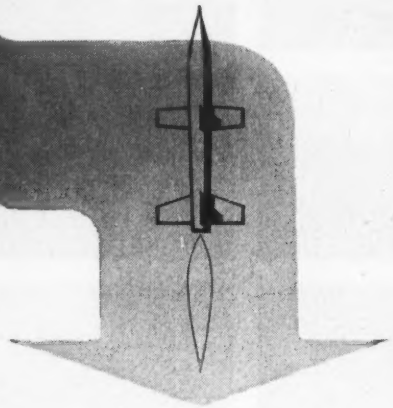
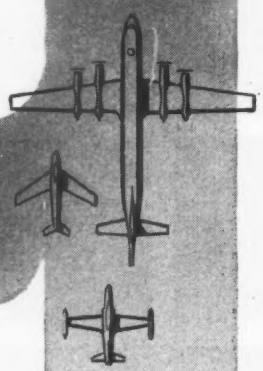
the CANADAIR contribution

Canada has received world-wide credit for the part she has played in the development of a strong NATO. Aside from material contributions to other nations she has made an equally important contribution to world peace by being strong herself . . . by keeping abreast of civilian as well as military progress throughout the world. Canadair is proud to be a part of Canada's strength in three important fields.







CANADAIR and GUIDED MISSILES

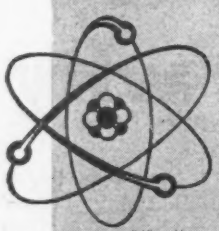
Canadair has long had a prominent role in Canada's guided missiles program. The company's experience in advanced aircraft systems engineering is applied to the design and development of these new supersonic weapons for the Canadian government.

CANADAIR and AIRCRAFT PRODUCTION

F86 Sabre jet fighters: Canadair produces this famous fighter for the RCAF and other NATO air forces. The fastest flying, highest climbing fighter aircraft in European multi-squadron service, the Sabre jet has proved its superiority in actual combat.

T33 Silver Star trainers: This Canadair-produced jet aircraft has become the standard trainer for RCAF and NATO student pilots.

Canadair CL28: This is the largest aircraft ever to be built in Canada, and will be used for reconnaissance duties by the Maritime Air Command of the RCAF.



CANADAIR and NUCLEAR PRODUCTS

In this new field of activity, Canadair's facilities for design, engineering, development and research are directed toward the production of test reactors for the government authority, Atomic Energy of Canada Limited. Canadair contributes to Canada's continuing program for the development of non-military uses for nuclear products.

CANADAIR HAS PRODUCED MORE JET AIRCRAFT THAN ANY OTHER CANADIAN MANUFACTURER

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AIRMAN'S BOOKSHELF

Roll Back The Sky, by Lt. Col. Ward Taylor, USAF (Henry Holt and Company, $3.95), is a real contribution to the air literature of WW II. This is a novel about the Pacific air war and the men who flew the B-29s through the fiery hell of low-altitude fire-bomb missions over Japan. It wasn't death that Captain Richardson, the book's hero, feared. Anybody could die, and he saw many who did. Death was a constant mission companion—from wheels up to wheels down. What bothered Richardson was the preying thought that he might someday begin to fear death. And this thought drove him to actions which earned him the respect of his crew and the love of two women—worlds apart. The author, a Pentagon staff officer and WW II bomber pilot, weaves a drama rich in description of war in the air, deep in the feeling of flight, and accurate in the narration of B-29 operations.

The B-29 proved a weapon the Japanese could not counter. More of the B-29 story, but from another viewpoint, is told by two former top Japanese air officers, with editorial help from an American writer, in a fine non-fiction documentary. *Zero!,* by Masatake Okumiya and Jiro Horikoshi, with Martin Caidin (E. P. Dutton, $3.00), is an absorbing, detailed history of Japanese military air operations from the Sino-Japanese conflict in 1937 through the Pacific war. It is the first full account of the air war in the Pacific from a Japanese viewpoint and shows how a nation with vast air resources went down to defeat because of failure to understand the true meaning of modern airpower. *Zero!* features many eyewitness accounts of air battles. It is a book military airmen and civilians interested in airpower history will enjoy.

From the pen of Florida novelist Pat Frank comes a new atomic age story *Forbidden Area* (J. B. Lippincott, $3.50). Frank, author of *Mr. Adam* and *Hold Back The Night,* centers this one around the strange disappearance of a "B-99," new type AF long-range, strategic bomber. It is bound to interest lovers of air fiction.

In a different vein a pair of new books deals directly with military airpower. The best is *Airpower* by Asher Lee (Frederick A. Praeger, $3.75), an informal analysis of the Free World's main military strength. Lee finds two main elements of this strength totally inadequate—air intelligence and air reconnaissance. Like many of his contemporaries, this author believes push-button war is far in the future. Manned aircraft will long remain the mainstay of airpower, with US airpower remaining the bulwark of western military strength. This is a book that should become a part of everyone's air library.

The Third Service, by Air Chief Marshall Sir Phillip Joubert, RAF (Thames and Hudson, London, $5.25), is a rather dull history of the RAF and study of the great English airmen. The basic theme revolves around the interservice struggles for power and in particular the continuous efforts of the politically powerful Royal Navy to grab the mission of the RAF, while the Army tries to use RAF power for limited tactical ends.

Two very fine, attractive Hanover House publications appear on the March listing: *Supersonic Aircraft: The Incredible Story of Flight Beyond the Sound Barrier,* by Roy Cross ($2.50), and *The Aircraft of the World,* by William Green and Gerald Pollinger ($7.95), in a new revised second edition. The latter is a complete and authoritative aircraft reference book, containing nearly 1,200 photos and three-view silhouettes.—END

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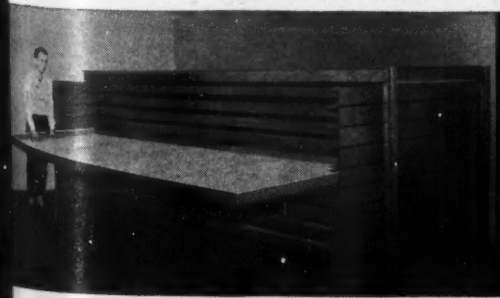

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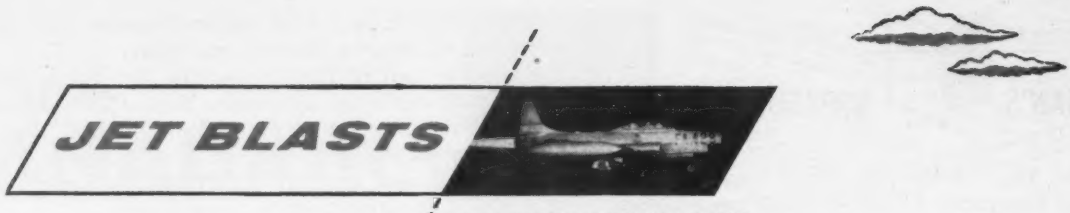


LET'S HAVE YOUR JET BLAST

In "Jet Blasts" you can sound off on any subject you want. We'll pay a minimum of $10 for each "Jet Blast" used. All letters must be signed but we'll withhold names on request. Keep letters under 500 words. "Jet Blasts" from service personnel do not necessarily report official policy.

Mental and Physical Exams First?

In the past it has been the policy of the United States Air Force to have the students in the AF-ROTC program given physicals and mentals at the end of their sophomore year to determine if they are capable to become Air Force officers.

As a result of this policy, many students enter the program with expectations of going into the Air Force at the end of the four years of college. They think that since they have been accepted they will be allowed to complete the course. When the time comes for the physicals and mentals, many fall out because they cannot pass the tests they are required to take.

If they do not pass the tests they are bitter toward the Air Force, and, as I am sure you know, their few uttered destructive remarks about the program can do extreme damage to the program itself—and to the United States Air Force.

I realize that the first two years will benefit the student and should help him to become an "air-minded" citizen, which this country so desperately needs. But the "flunked" students do not see the matter in this light. "They were just given a rough deal." I know too many cases of failed students and their disappointment and bitterness.

It seems that a complete and thorough physical examination given to freshmen upon entering the program would solve many problems and allow the student with the potential of becoming an air crewman the satisfaction of knowing that he possesses those physical requirements. Another advantage will be that those selected will be fewer and perhaps, with smaller enrollment, emphasis can be placed on quality.

Cadet Lt. Col. Jack L. Wilson

The Staff Study—A Creative Tool

Recently, the Hoover Commission on Organization of the Executive Branch of the Government criticized the Department of Defense because the military research and development program was not sufficiently "daring and imaginative" in developing new weapons. One wonders if the Commission was allowed to peek into the Tip Top Secret drawers, but at the same time one must admit that it is quite novel for the Hoover Commission to urge that more "daring and imagination" be used in the spending of government funds. However, the military mind—if there is such a thing as a military mind—has not gained a reputation of being imaginative; in fact, our imaginative generals have stuck out like a bumptious blond in a prop wash. Our Stuarts, Jacksons, Pattons, and Billy Mitchells have been rare. Even imaginative Napoleon refused to purchase Robert Fulton's submarine which might have helped against the British Navy. Napoleon also turned down shrapnel—invented years before Waterloo—not realizing that Wellington feared he might use it against the British square.

However, whether we mangy military minds are imaginative or not, is definitely not the point. The set-up—and we democratically approve of the set-up—has us defenseless game for the name. In the military, we do not make the shoe; it may not fit, but we wear it. We are unimaginative. Hoover has told Congress. Congress will tell the President. The President will tell the Department of Defense. Certainly, the Department of Defense can tell only us. So . . . get out and be imaginative! That's a command!

All of which reminds me of when I was in OCS being chewed by an officer who was very unhappy over the fact that I had failed to procure a certain item because supply was out of it.

"Other places than supply might have it," he snarled sarcastically. "Didn't you ever think of that? Why don't you use your imagination?"

"Why don't you imagine he has it and quit your beefing?" suggested one blithe unknown in the rear ranks.

The point of that gem is that this "Use your imagination!" order has a proper who-to-whom directional relationship and as usual in this organization that direction is from top to bottom. Airman! You are unimaginative!

How do we defend ourselves? For every offense there is a defense. But we cannot be satisfied with static defense. We need an imaginative counterthrust. And we have it. Right under our eyes. Gentlemen, I offer you a proven weapon. It is a weapon which can be skillfully used in a new way, a weapon which can be a creative tool of the mind. I refer to the staff study. Ignore me not. Remember, someone once said that the pen is mighty like a sword. Both do have their points. However, believe it or not, it is the good old staff study which can make us imaginative.

Perhaps you feel there are other paths to the freedom of the imagination. There are other paths. Don't bother to check the regulations, however. Can't you just see a reg headed "Procedures for the Proper Functional Utilization of an Imaginative Cerebrum" with, right under it, "Scope: From Ear to Ear"? It is highly doubtful that regulations will help. However, Dr. Alex F. Osborn has written a forceful book on the subject called "Applied Imagination" which might help. He has this imagination problem all wrapped up in easy words so that even buck sergeants and majors can understand it. However, Dr. Osborn doesn't develop a trick in his book which cannot be duplicated by a staff study properly used.

What Dr. Osborn does, which we usually fail to do, is to dare to use the word "imagination." You will remember the second looey who defined a colonel as an old duffer who pounded the desk and growled for "Facts! facts! facts! facts!" In fact, we are so leery about the word

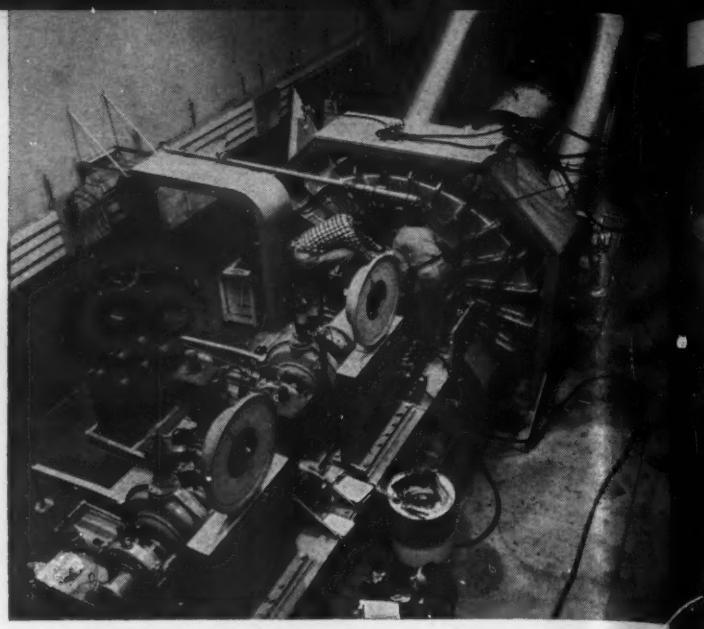
(Continued on page 26)

General Electric announces . . . . . .

A NEW DEVELOPMENT CENTER FOR ADVANCED, SUPERSONIC AIRCRAFT ENGINES

PLEASE TURN PAGE . . .

SEA LEVEL AIR PRESSURE CAN BE INCREASED 20 TIMES inside new Component Development Lab. Scale model of Lab's extensive air supply system is examined by D. Cochran (right) AGT Development Dept. Manager, and B. W. Bruckmann.



POWER OUTPUT OF ADVANCED TEST TURBINES is measured by these two 6000-hp 12,000-rpm dynamometers (foreground). These machines allow turbines to be tested without air compressors, cutting development time and cost.

HIGHLY ADVANCED PRIVATELY-OWNED FACILITIES IN FULL OPERATION TODAY

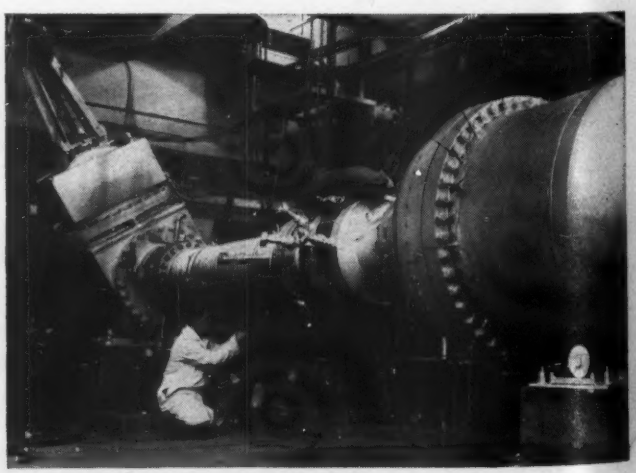
General Electric has provided aircraft propulsion facilities valued at $100 million—*with emphasis on development*

Fully equipped for studies on all types of propulsion systems, including advanced supersonic jet engines, the Aircraft Gas Turbine Division's new development center at Evendale, Ohio, is a typical example of the continuing G-E investment in the future of American aviation. Already in place to help G.E. speed propulsion progress are Company-owned facilities with a replacement value of $100 million.

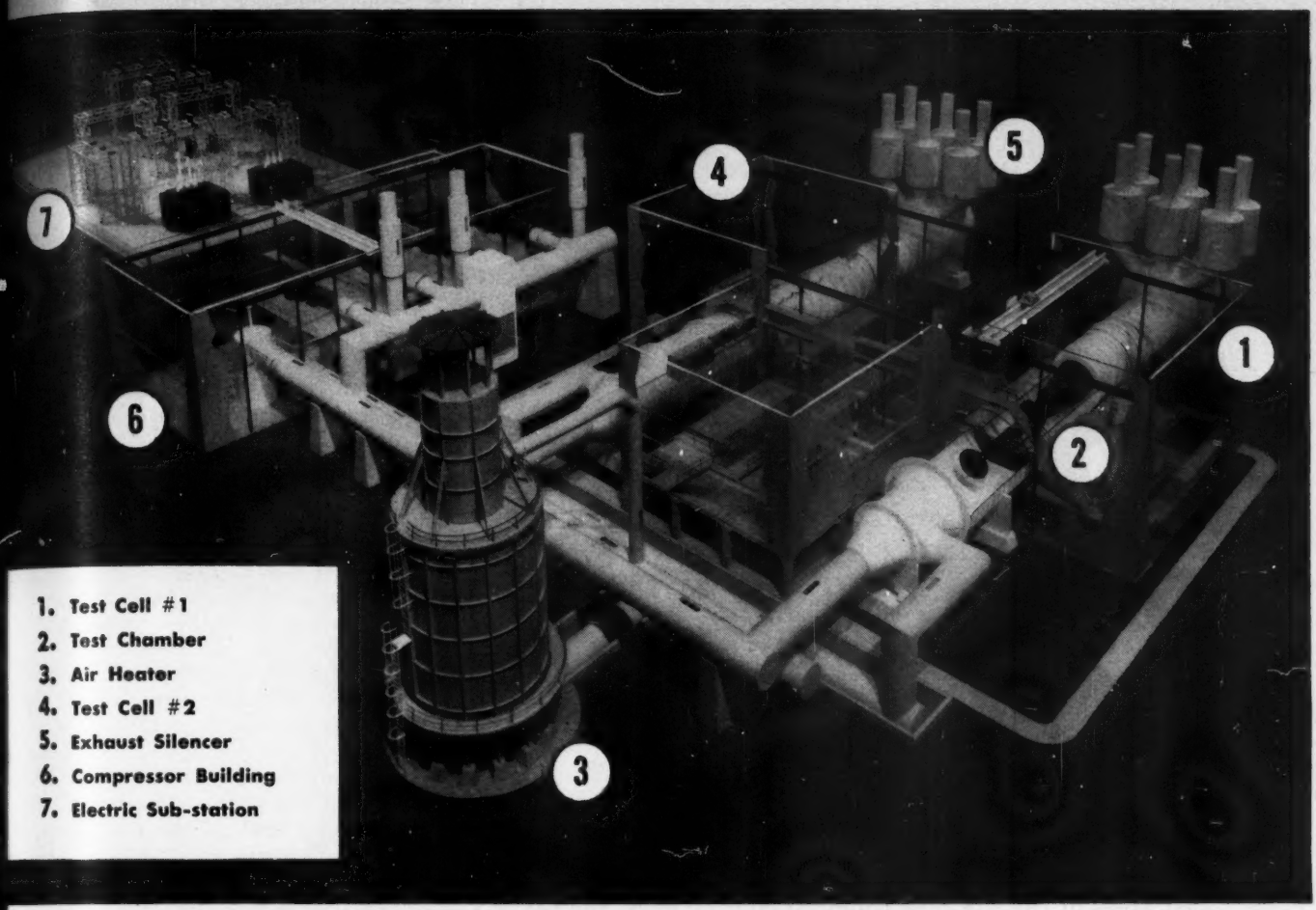
The center at Evendale contains the newest equipment—the most advanced of its kind—for investigation of aerodynamic and mechanical engine component designs . . . materials . . . fuels . . . combustion and ignition. Begun in 1950, it is now in full-scale operation. Already employing over 1000 highly-skilled technicians, the center's final size will be determined only by future powerplant needs of the Armed Services and this nation's airframe companies.

Efficient, on-time development calls for *continued* expansion. Already scheduled is a new Supersonic Propulsion Facility, plus a new testing area for super-

NEW COMPUTATION BUILDING (background) contains huge new electronic computers which permit rapid, low-cost appraisal of developments before they reach G-E drawing boards.



SUPERSONIC COMBUSTION TESTS provide valuable performance data on latest engine components. System of pipes duplicates air intake and exhaust conditions found in actual flight.

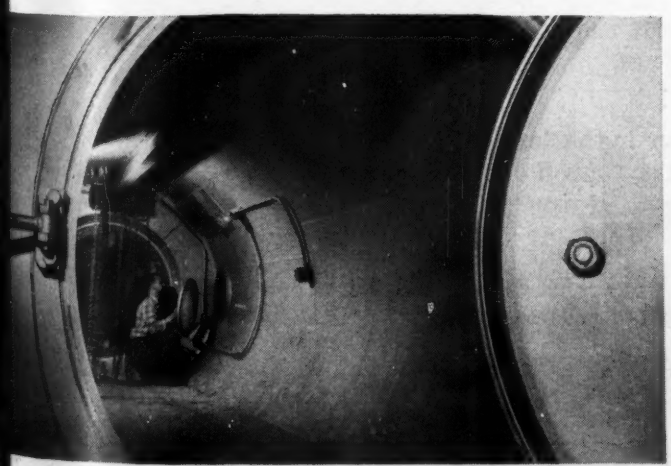


MOST ADVANCED PRIVATELY-OWNED ENGINE TEST FACILITY IN THE NATION, to be built in 1956–57, will simulate Mach 3.5 at 60,000 feet. Full-size engines will be evaluated at "in-flight" speeds as high as 2300 mph.

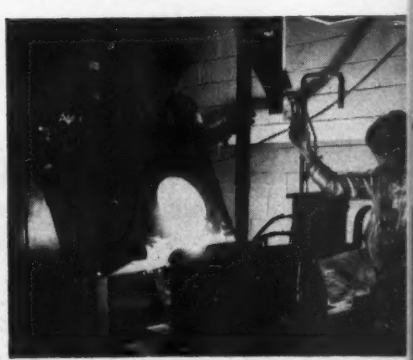
sonic rocket and ram-jet engines.

When these G-E facilities are completed, they will provide AGT with the most advanced, privately-owned supersonic development tools. Propulsion research and development work done at Evendale will continue to be supported by the Company's Aircraft Gas Turbine Laboratory at Lynn, Mass., and by the G-E Research and General Engineering Laboratories at Schenectady, N. Y. General Electric Company, Cincinnati 15, Ohio. 235-2

NEW SPECIAL FUELS FACILITY helps G-E chemists explore possibilities of new fuels for tomorrow's planes and engines.



20,000 RPM SPEEDS AT 4500 HP test efficiency of new jet engine compressors in these test tanks. Compressors are tried out under both sea level and high altitude operating conditions.

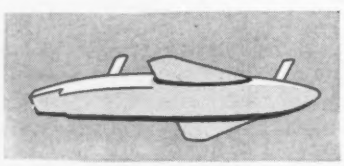


HIGH TEMPERATURE ALLOYS for items like engine gears, bucket blades, and turbine wheels are investigated in this modern, well-equipped alloy foundry. Furnace at right produces molds for new jet parts.

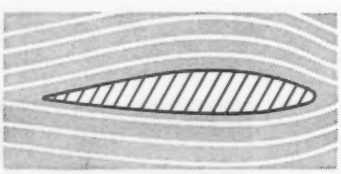
Progress Is Our Most Important Product

GENERAL ELECTRIC

Recent Stroukoff research and development achievements in aircraft landing devices and boundary layer control have opened up vast areas of the world as potential landing fields for heavy aircraft. Pantobase, which has been incorporated in an assault-type transport, for the U. S. Air Force, will contribute materially to the advancement of logistical and troop support techniques.



Pantobase is a landing system which enables an aircraft to land and take off from water, snow, ice, sand and unimproved terrain thus reducing the need for conventional airfields.



BLC-Boundary layer control as developed by Stroukoff increases the effective lift and delays stalling of the wing, thereby reducing required speeds and distances for take-offs and landings.

Achievement is a tradition at Stroukoff. A leader in the development and design of cargo and transport aircraft, Stroukoff offers challenging opportunities to creative engineers.

Extending the Frontiers STROUKOFF AVITRUC *of Aircraft Performance*

Stroukoff

WEST TRENTON, NEW JERSEY

"imagination" that when the Air University started a course based on Dr. Osborn's book, the course was called "Problem Solving."

Dr. Osborn has been very successful with his book. His principles and procedures of creative thinking have swept the country. His courses in creativity have been organized in colleges and corporations across the nation. He's got somethin'. Nothing that a staff study doesn't imply, but definitely somethin'.

This is Dr. Osborn's theme. Imagination is all-important. It built this civilization. It is indispensable in science and business; leadership and lucrative careers exist not without it. Further, most people have much more imagination than they realize. However, most do not know the proper way to use it. And, claims Dr. Osborn, there is a proper way. In fact, he believes the most important new invention was the invention of inventing, the development of the method of thinking creatively. Apparently, he had never heard of the staff study.

Dr. Osborn's explanation of how to be imaginative, how to create, how to invent, is very good. He points out that we "set our sights," that only occasionally are good ideas accidently stumbled upon. We must focus our conscious creative effort, we must know our target and aim for it. In many cases, according to Dr. Osborn, one target creates another, ideas just keep popping out. Now all of that has sort of a familiar ring. It seems to me, I first read the same thing in different words in an old manual on staff studies. It started, "First you must state the problem. . . ."

Dr. Osborn also stresses what he called the "uninhibited search for hypotheses, variations, correlations and combinations." He claims that a quantity of ideas yields quality. He strives for an endless piling up of alternatives. Especially when doing group thinking, should quantity be stressed before quality. At first, a group should just spout ideas without being critical of those ideas. "Every idea, crackpot or crackerjack" should be written down. With a staff study, you do the same thing when you start writing ideas under "Factors Bearing on the Problem." Of course, Dr. Osborn realizes that after you ascertain every factor which relates to the problem—if that is possible—you must analyze all those factors and determine which influences the situation the most. In the staff study's "Discussion," you would apply what

(Continued on page 29)

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Whether to guide a missile, to detect an enemy, to navigate a plane or to sight a gun... modern defense systems depend on computation.

And computation is Burroughs' business. It is the basis of our worldwide reputation for outstanding high-speed business machines . . . and of our recognition in the advanced fields of electronics and magnetics.

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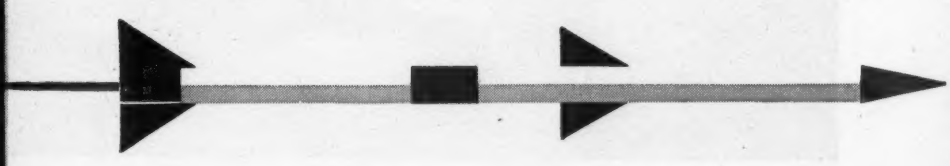

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reliability

no new subject at Collins

Although the subject of reliability is currently attracting great interest among communication people, it has always been a basic design consideration at Collins. The maturity of Collins reliability program is exemplified in Collins leadership in supplying military and commercial aeronautical customers with both ground and airborne electronic equipment. Maximum reliability is designed into all equipment in engineering and is assured through manufacture by constant inspection and test. Guaranteeing this reliability is a well-organized four point reliability program:

Design Engineering
Maximum simplicity possible in original equipment design.

Component Evaluation
Extensive testing to assist design engineers and to maintain control of component use. Cooperation with suppliers to improve component reliability.

Equipment Testing
Continual checking during manufacture plus endurance and environment final tests to assure reliability specifications.

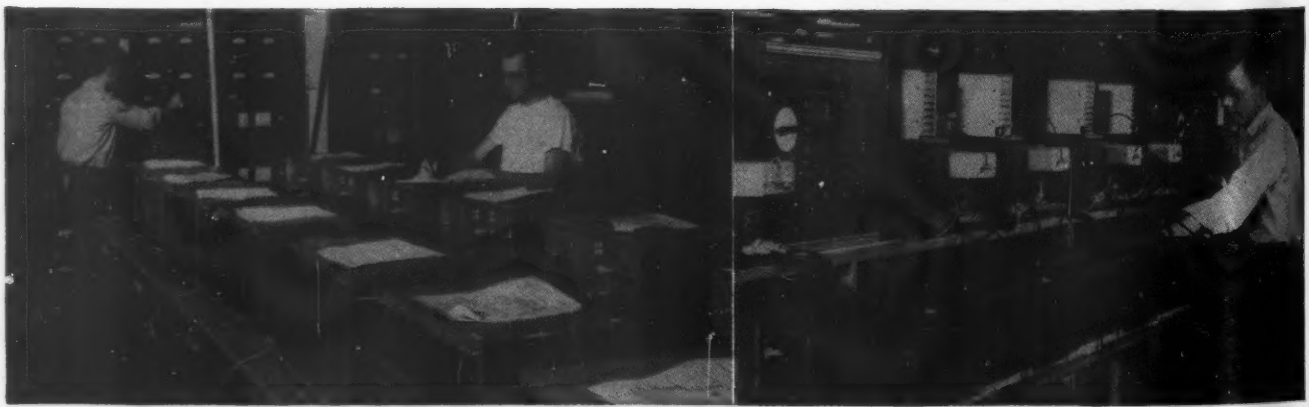
Systemetized Reporting
Field service personnel channel performance data through engineering and manufacturing for reliability improvement.

BOTTOM LEFT

Frequency recording equipment plots oscillator stability to assure optimum performance of ground receivers to be delivered to the military.

BOTTOM RIGHT

Before final O.K. new 618S Transceivers and 180L Antenna Tuners are automatically cycled for twenty hours to insure superior reliability from the instant they are put into actual use.



Collins — CREATIVE LEADERSHIP IN ELECTRONICS

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he calls "judicial judgment," which he thinks you should never use at first or you will dampen creative zest. Also, he realizes that you must finally make up your mind, that is, form the staff study's "Conclusion" and further, take action on that conclusion or as phrased in the staff study, write the "Recommendation."

Thus, it seems that the staff study form is very good for creative, imaginative thinking. However, note that the imagination gets its greatest play in the first two parts of the staff study form, and especially in the second step, "Factors Bearing on the Problem." For instance, let's suppose the problem is something like this: "To Determine the Best Means to Defend the USA." Just trying to write down all the factors bearing on that problem demands much more imagination than would an analysis if you knew all factors. In a staff study, the place for really letting the dream-schemes soar is when writing down those factors.

Although Dr. Osborn does not teach the staff study one thing about form—after all, the staff study is a time-tested method for thinking correctly—he does give many useful hints on how to dream up new factors bearing on the problem. At the same time, he does make the old "I-want-facts-Colonel" look a little silly. Of course, if we had continued to base all our judgment on known facts as the Colonel wanted us to do, we would have never built an atomic bomb. It was just a lot of imagination until it went bang! Airplanes were just fantasies for a long time also. But now both planes and atomic bombs are facts. And other people have them—bad, nasty people who do not seem to be on our side. So we do need more imagination. Perhaps that is why the Hoover Commisison seems restless.

So now we must bark to our subordinates a new up-to-date theme. We no longer say "I want facts!" Instead we say, "Be imaginative! Write a staff study! And I want fantasies! Do you understand? Fantasies! Don't bore me with facts. I want fantasies!"

Also . . . now we read regs AND science fiction.

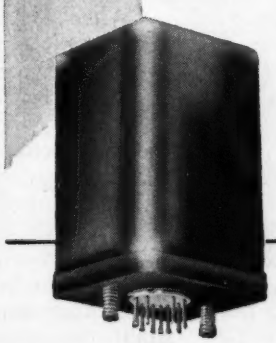
Maj. Bert Decker

The views expressed in the above article are those of the author and do not necessarily reflect those of this magazine, the Air Force, or the Department of Defense.—The Editors.

CHAMPION
of SAC competition

The B-47 "City of Merced" . . . a combination of flesh, metal and electronic brains . . . earned the title of "best" in the recent SAC competition. Its K Bombing System, with dependable precision amplifiers, assured exacting "bomb" release for pin-point target hits. Thousands of B-47 "winners" are using DuKane amplifiers in their K Bombing Systems . . . producing an all-weather umbrella of destruction to any would-be aggressor.

The same pin-point precision is available in specifications, tolerances, production and packaging for your amplifier projects. DuKane will give immediate consideration to any of your amplifier needs. Call or write Government Division, DuKane Corporation, St. Charles 3, Illinois.



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An Editorial

Why the Reserve Has No Technicians

By Edmund F. Hogan
RESERVE AFFAIRS EDITOR

AS WE HAVE pointed out before (AIR FORCE, January '56) the establishment of an air technician program is a basic requirement for the Air Force Reserve.

Briefly, this program uses full-time civilian employees in place of the active-duty Air Force people who are now assigned to Reserve flying units. The civilian employees, however, must be members of the units in which they are employed, and go on active duty with their units when mobilized.

The Air National Guard has had a similar program since 1946. The years have proved it to be an unqualified success. There is every reason to believe that this program in the Air Force Reserve would be equally successful. An air technician plan for the Reserve was developed by Continental Air Command a year ago. It is specifically designed to improve the combat-readiness of the twenty-four Reserve flying wings. But there are other important by-products.

First, the technician plan would release some 9,000 active-duty Air Force officers and airmen for assignment elsewhere in the Active establishment. Second, it would save about $2 million a year in salaries alone and an estimated $9 million a year in hidden costs required to support the present system.

Last June the Air Force submitted the plan to the Department of Defense, specifically to Carter L. Burgess, Assistant Secretary of Defense for Manpower and Personnel. Mr. Burgess looked it over and sent it back to the Air Force for answers to questions which had risen from a review of the plan by his staff.

On August 31, Air Force Secretary Quarles sent a memorandum to Mr. Burgess, replying to the questions he had asked. One of these concerned Civil Service status of the technicians. The legal and technical staffs of the Civil Service Commission agreed to the plan, but the Commission chairman wanted the endorsement of the Department of Defense. Mr. Quarles's memo urged that Department endorsement be conveyed to the Civil Service Commission as soon as possible.

That endorsement is still to come. In fact, every attempt to get Mr. Burgess to approve the plan has failed. Even the recommendation of his own top advisory group, Defense Department's Reserve Forces Policy Board, has not moved Mr. Burgess. This board, headed by Dr. Milton G. Baker, has approved the air technician plan. Moreover, a few weeks ago Dr. Baker, in a personal appearance before Defense Secretary Wilson's Armed Forces Policy Council, specifically recommended that the air technician plan be given the green light. Still, the plan remains pigeonholed.

Recently, Congressman Ed Edmondson of Oklahoma asked Mr. Burgess to tell him why he continued to hold up the plan, Mr. Burgess replied as follows:

"The plan is currently being studied in my office both with regard to its intrinsic merits and its relationship to other important elements of the program.

"When our review is completed, a determination will be made as to whether the proposal will contribute to the effectiveness of the Reserve program."

That would indicate that Mr. Burgess has no confidence in his own Reserve Forces Policy Board, much less in the Air Force itself. It would seem that he still is not convinced that the plan "will contribute to the effectiveness of the Reserve program," despite the proved success of the same project in the Air Guard, and despite the fact that everyone else concerned has approved it. But Mr. Burgess is far too smart a man to be so illogical as that.

Why does Mr. Burgess continue to sit on the plan? For the answer to this mystery we apparently must consider a few "extenuating circumstances."

Mr. Burgess happens to be directly responsible for the success or failure of the Administration's National Reserve Plan. This law offers young men a number of options for completing required military service. One option permits a youth to volunteer for six months of active-duty training, following which he has a total Reserve obligation of seven and one-half years.

Up to the moment, at least, the Air Force has wanted no part of this plan, on the grounds that the six-month training cannot possibly furnish it with the highly complex skills it needs. Mr. Burgess has been almost violent in his insistence that the Air Force use the plan.

So the plot thickens. With the air technician plan in his bottom drawer, Mr. Burgess has something the Air Force wants. If the Air Force wants the technician plan badly enough it presumably can get it—by accepting the six-months' feature of the National Reserve plan.

Mr. Burgess indicated this himself not long ago. When asked why he was holding up approval of the technician plan, Mr. Burgess replied, in effect:

"When the Air Force shows some good faith to us, we'll show good faith to them."

Now there is no connection between the air technician plan and the six months' training program. Each should be considered on its own merits. There is no reason why the Air Force should be required to take six-month trainees —and jeopardize its recruiting program—in order to get civilian employees for its Ready Reserve. No reason, that is, except Mr. Burgess.

Many times in the past when the Air Force Reserve program has bogged down, it has been difficult to pinpoint those responsible. Not so in this case. The responsibility lies squarely with Carter Burgess.

We think it's high time Secretary Wilson stepped in, and stepped on his ambitious Assistant Secretary.

We hope the Air Force holds tight and refuses to make a "deal" in order to get air technicians, despite the obvious need for them. Once it becomes party to gangsterism, there'll be no end to it.

Congressman George Mahon of the House Appropriations Committee has promised to take a full look at the Defense Department's delaying action. We hope this will result in full support of the Air Technician program.

Lacking such straight-forward action, many thousands of Reservists have every reason to wonder whether they are getting more lip service than sincere leadership in building a Ready Reserve.—END

Rush service to the top of the world!

On watch 24 hours a day, DEW (that's *D*istant *E*arly *W*arning) will probe the polar sky with radar. The DEW line will stand between *you* and a sneak attack over the top of the world.

Far north of any road or railroad, the DEW line depends on air transport for all supplies. Douglas transports, especially the C-124 Globemaster, handle the bulk of this assignment.

Big enough to swallow a tank, truck or a giant bulldozer. The C-124 moves cargo in quantity *so far and so fast* that logistics experts can plan smaller stockpiles—and less material en route in slower "pipelines." That results in stretching defense dollars farther. And the Douglas C-124 also doubles as a troop transport, hospital ship, repair shop or flying office.

Lifeline for the DEW Line—18th Air Force Douglas C-124

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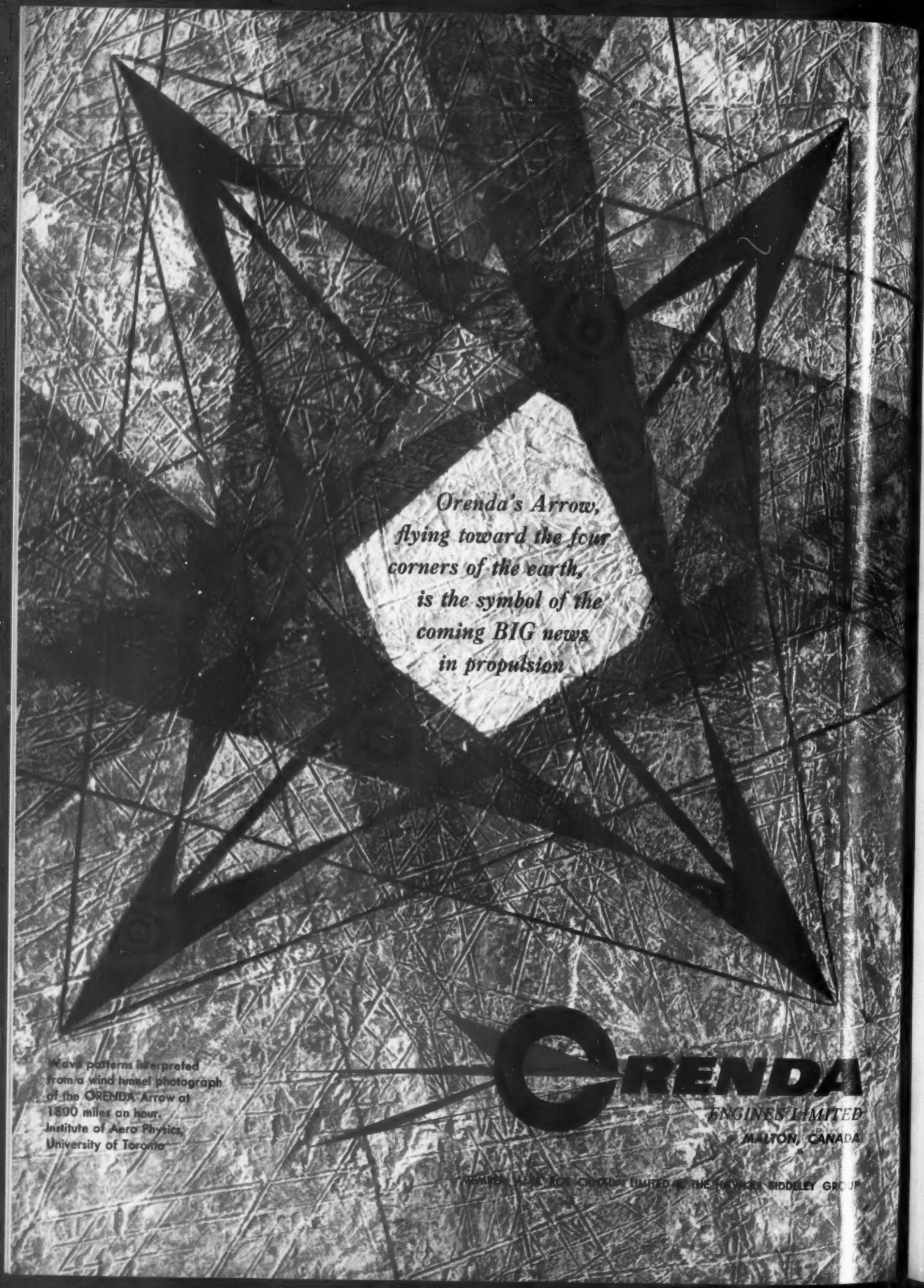

Mach patterns interpreted from a wind tunnel photograph of the ORENDA Arrow at 1800 miles an hour. Institute of Aero Physics, University of Toronto

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SHOOTING THE BREEZE

WITH JOHN F. LOOSBROCK, MANAGING EDITOR, AIR FORCE MAGAZINE

Maj. Alexander P. de Seversky has never been accused of erring on the side of conservatism in his public statements. Latest sortie in an iconoclastic career came in a New York speech before an audience of Air Force, Navy, and Marine Reservists, when de Seversky advocated transfer of the Marine Corps from the Navy to the Air Force.

"Only the Air Force," said de Seversky, "which is specifically designed for such global strategic operations, can enable the Marine Corps to fulfill its historical mission of spearheading the physical contact with the enemy in order to impose our will. . . . In my opinion, the umbilical cord that ties the Marines to the surface Navy must be cut if the unique talents of the Corps are not to be lost under today's dynamic conditions of modern warfare."

☆

Tony LeVier, Lockheed's chief test pilot, says, "The only trouble with airplanes is that they don't fall up!"

☆

One of the outstanding accomplishments of AFA's recent Jet Age Conference (*see page 131*) was the fact that it brought the noise problem out in the open for the first time. Shortly after he had addressed AFA's audience on the problem, AF Chief of Staff General Twining made a similar presentation to the US Conference of Mayors,

which brought this comment from Representative Leroy Johnson of California:

"One of the best addresses made before this conference was made by General Twining. In direct but courteous fashion, General Twining explained to the mayors that operations on AF bases which may cause discomfort and annoyance to the communities are essential to the defense of America."

☆

More editorial comment on noise:

From the *Spokesman Review*, Spokane, Wash.: "Fairchild [near Spokane] is scheduled to have B-52 bombers within the next year. Although the news may be disturbing to some residents of the city, the Air Force officers should not be overly concerned that their friendly relations with Spokane's citizens will be at all impaired.

"They should feel assured that Spokane is a thoroughly loyal American city and utterly proud of the armed forces of the United States. Certainly it is true that the noise of military jet planes is alarming at times, but in this locality we are everlastingly grateful that all of them will be on our side in any war, and grateful to the men who take enormous risks to fly them every day."

And from the Atlanta *Constitution* (in reference to the AFA Jet Age Conference): "It is good to remember that railroad noises were just as disturbing to our ancestors as jet sounds are to us and that this generation has learned to sleep through the noise of diesel trucks on an upgrade.

(Continued on following page)

This month's Breezecake girl is not identified by name. The accompanying release, from the American Latex Products Corp., however, describes the 1/50th scale model of the Douglas DC-7. It's made by Pacific Miniatures from a new rigid, foamed-in-place polyurethane Stafoam. The model "is made from a single mold, into which is poured a mixed liquid resin and di-isocyanate." The new process, the release goes on to point out, "cuts hours from the time usually required in model-making."

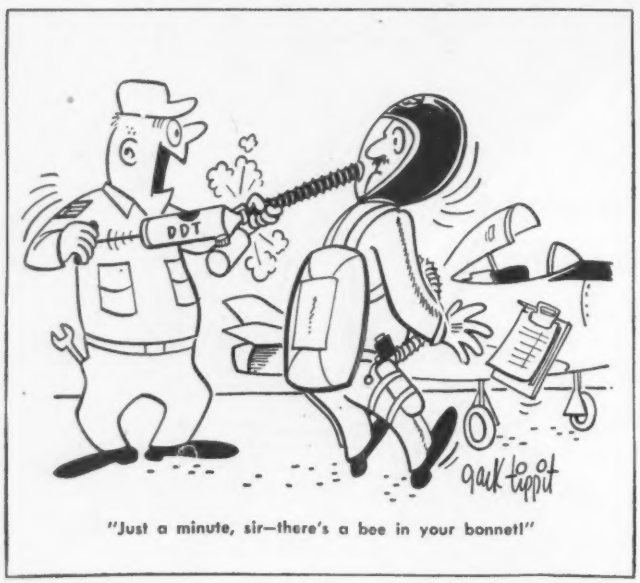
"Jet sounds are disturbing. But at the same time they are reassuring signs that we still have a national defense program. In fact, in view of some of the news concerning Russia's advances in the field of nuclear weapons, the skies of America might not be noisy enough."

☆

One of the best comments on research we've seen was in an address by Mr. Lionel D. Edie, board chairman of Lionel D. Edie & Co., before the National Industrial Conference Board in New York. He said:

"If you do not believe in research you might just as well give up in the whole matter of competitive coexistence. I believe that is not what the American people are going to do. They are going to win the battle of the guided missile in the next five to ten years and, in winning the battle, they will also win the battle of research and development as it becomes a factor in the dynamic growth trend of American industry and American business.

"If there were one thing that dictates the trend of the next ten years more than any other, I would say it is not the birth rate of the population, but it is the birth rate of new ideas generated in the laboratories of American industry."



"Just a minute, sir—there's a bee in your bonnet!"

☆

According to former Senator William Benton, who went to Russia last fall to examine the Soviet educational and propaganda mills, "The Soviets have sought to combine high quality in scientific and technical training and research with intensive courses and training in Marxist-Leninist-Stalinist ideology. If they can succeed in this combination, they may have discovered a 'formula' more dangerous to us than the hydrogen bomb."

☆

An Associated Press dispatch from Germany quotes an anonymous AF sergeant in the Matador squadron stationed there.

"It's frustrating at times to be in a tactical missile squadron," said the sergeant. "You take 'em apart, you put 'em together again, you get ready to fire them, but you never do."

The sergeant's frustration stems from the fact that there is no practice missile range in West Europe. For field firing the AF must go to Libya, in the desert near Wheelus Field, Tripoli.

New emblem for Alaskan Command, its first since becoming a unified command in 1947, symbolizes the striking power of Air Force, Army, and Navy units there.

☆

In commenting on the forthcoming investigation of our airpower by the Symington subcommittee, Secretary of Defense Wilson said, "I hope he finds out he doesn't know as much about it as he thinks he does."

The St. Louis *Post-Dispatch* pointed out editorially, "He [Wilson] would have shown a better spirit had he said he hoped Mr. Symington would turn in a useful report." The *Post-Dispatch* could have added that the compilation of a "useful report" is a responsibility shared equally by the subcommittee and the Administration.

☆

Here's an anecdote that filtered back to us from Europe. Seems a mixed group of paratroopers from the NATO nations were jumping at an air show in France. The first man froze in the doorway and the whole stick got panicky. The jumpmaster was inspired. He lined up the French troopers and said, "Go ahead. It's chic." Out they went. The Germans were next. "Jump. It's your duty." The British leaped because it was "the sporting thing to do." The Italians went out because it was "Forbidden." Last were the Americans, who hung back until the jumpmaster cracked, "Go ahead and jump. It's a good deal."

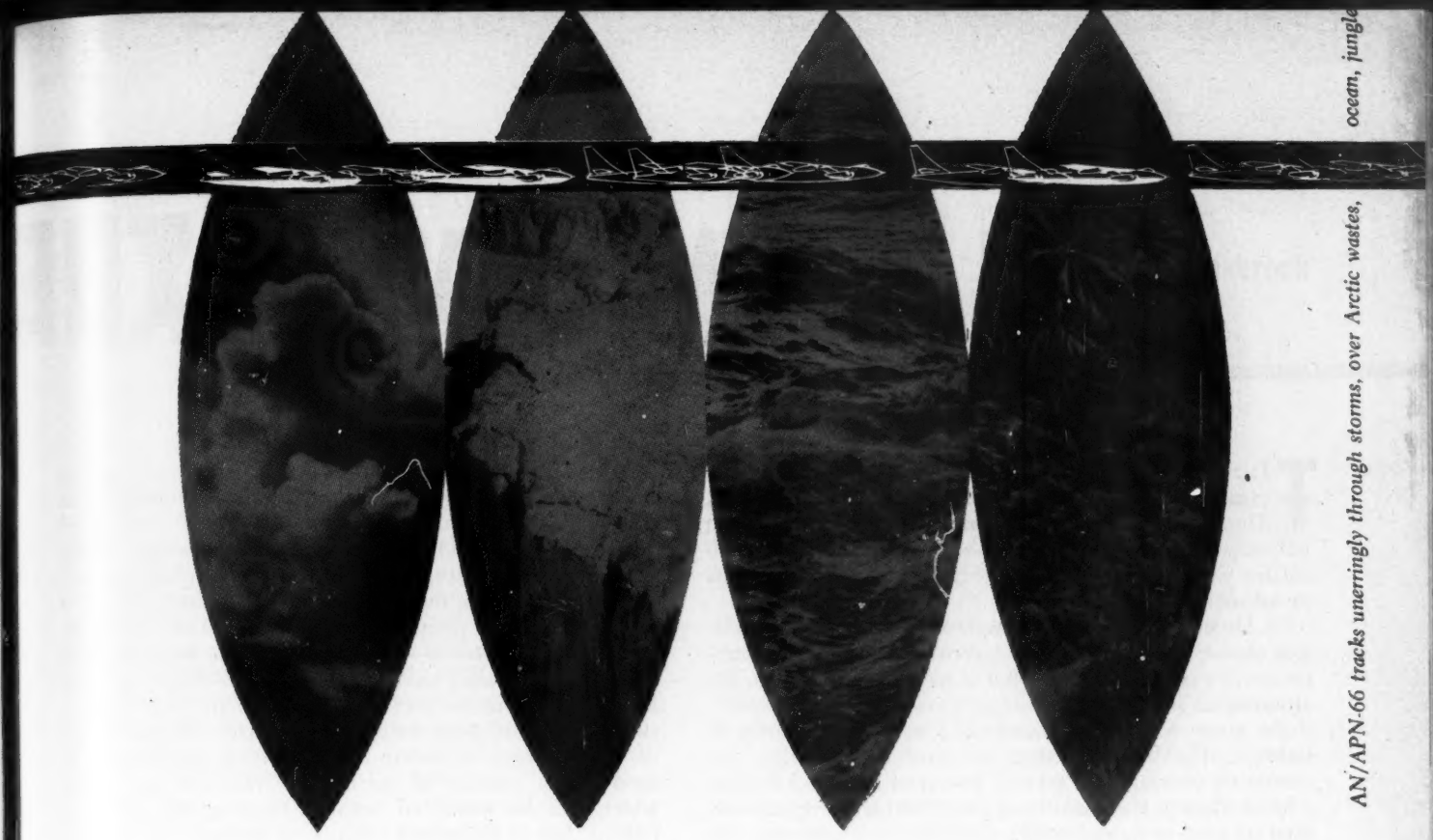
☆

Our apologies to Lloyd Mallan, author of a new book called *The Secrets of Space Flight*. In last month's "Airman's Bookshelf" column, we called it *The Secrets of Outer Space*.

☆

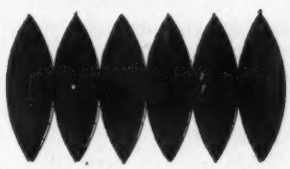
REUNIONS: Stalag Luft III Alumni: POW reunion celebrating eleventh anniversary of release from German prison. To be held in **Van Cleve Hotel, Dayton, Ohio,** Saturday, **April 28.** For information write to David Pollak, The Pollak Steel Co., Box 513, Marine, Ohio.

96th BOMB GROUP (Heavy): Reunion at Altus AFB, Okla., May 25, 26, and 27. Big celebration sponsored by SAC's 96th Bombardment Wing, B-47 outfit stationed at Altus. For information write to **Maj. Wilmer A. Stanley,** Information Services Officer, 96th Bombardment Wing, Altus AFB, Okla.—END



AN/APN-66 tracks unerringly through storms, over Arctic wastes, ocean, jungle

planes that need never get lost —anywhere



GPL has produced the most advanced automatic air navigation system known to exist.

It guides an airplane to its destination *under any conceivable conditions.* It is not in the experimental stage; the system has been in production more than a year, flown millions of operational miles. It is completely self-contained, needs no ground guidance, no search radar, no optical observation. It works equally well anywhere in the world. Its operation is virtually instantaneous.

This GPL System is called AN/APN-66.

Fly over empty seas, barren deserts, featureless ice fields, mountain ranges. Fly at the highest altitudes aircraft have reached or skim the surface of the sea. Fly arrow straight or tossed like a leaf in a hurricane. It makes no difference. Snow, fog, electrical interference, make no difference. AN/APN-66 always knows exactly where a plane has been, where it is, and where it must go to reach its goal.

The military application of a system of such capability is far reaching. To achieve it, GPL mobilized scientific manpower and facilities in a large-scale emergency program in cooperation with the Air Force. Four other GPE companies also took part. Even so, development of AN/APN-66 took eight years, for it required a seemingly impossible engineering achievement: the harnessing of the physical phenomenon known as "Doppler-effect."

The "Doppler-effect" is the shift in the frequency of waves, sound or electrical, transmitted from a moving object to a stationary observer. It is most familiar as the shift in the pitch of a train whistle as it approaches and passes. AN/APN-66 measures a similar shift in the frequency of radar waves it bounces off the surface of the earth below. From the difference in frequency between the original wave and its echo the system computes the speed and direction of the plane's movement in relation to the ground. Electronic computers use this data to keep continual track of the plane's position by what is, in effect, automatic, instantaneous and highly precise dead reckoning.

This outstanding product of GPL's engineering skills and creativity—and its variations, the AN/APN-82 and AN/APN-89—are in use in a wide range of service planes—bombers, patrol craft, transports, mine layers, hurricane hunters. Every day the systems go into more aircraft as standard equipment. When put to civilian use, they will guide air liners to the remote corners of the world with equal accuracy.

While you may have no need for a navigation system, you may very well have need of the engineering skills and advanced technological resources that made AN/APN-66 possible. These are at your service.

To learn how GPL products and engineering skills can help you, write to:

ENGINEERS — invest your future wisely by working with the pioneers in Doppler and Doppler-Inertal systems.

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What About THEN

THIS month we are devoting the major portion of our magazine to the story of the Strategic Air Command. The occasion is the tenth anniversary, on March 21, not only of SAC but of Air Defense Command and Tactical Air Command as well. We will treat of ADC and TAC in subsequent issues.

"A Decade of Security Through Airpower," the new slogan of the Air Force, is really more than a slogan. It represents a vast achievement. But it marks, not so much the attaining of a goal, as a pause at a crossroads, so to speak.

To quote SAC's Commander-in-Chief, Gen. Curtis E. LeMay: "Building a modern air force is something you cannot do overnight. It takes a period of time and it takes a lot of money. It's a matter of establishing a program and then sticking to it, and eventually you reach your goal. By that time the first part of the force is obsolete and you start over again; so it really is a never-ending chore."

"This "never-ending chore" of maintaining a continuously superior military force-in-being—as a deterrent to all-out war—is relatively new. Thus far we have been successful.

How long that position will obtain is another matter. For the first time in recent years it is being seriously threatened. As we look back on a "decade of security," we face the decade before us with the prospect of frightening insecurity.

We have already conceded to the enemy in terms of quantity. We could be handing him the edge in quality of aircraft as well. This situation has gone beyond the calculated risk stage and is fast becoming what one expert has called "A special form of national suicide, in which we do not need to indulge."

The quantity race was lost in deadly sequence—first in fighters, then in long-range bombers. Tomorrow it could be the Intermediate Range Ballistic Missile or the nuclear-powered bomber. Eventually it would be the Intercontinental Ballistic Missile. If this trend continues we will inevitably wind up with the world's Number Two air force —Number Two in all respects. This could mean ultimate defeat.

Yet some of our leaders are beginning to hint that we somehow can maintain adequate security with a second-best air force. Such rationalization stems from a reluctance to face the fact that maintaining the world's best air force will require a radical rise in Air Force spending. Price tags on airpower are going up. The B-29 cost $650,000 apiece. The B-36 costs more than $3 million; the B-47, $2 million; the B-52 will run around $6 million each. And it, too, will have to be replaced and the price of security will go up and up.

There are no short-cuts. The ferment of technological progress permits no lagging. We must effectively pursue *every* avenue to air supremacy and without knowing what precisely lies at the end of each road.

Successors to the B-52 are already in the works. Will it be a chemically-powered bomber, using so-called "exotic," *i.e.*, non-petroleum, fuel? Or a nuclear-powered aircraft of almost unlimited range and endurance? The Intercontinental Ballistic Missile would be a valuable supplement to our manned bomber force, and might eventually replace it in large part. But the present state of the art, and the overriding need for *continuous* air supremacy do not permit us, at this point, to choose which of these should be pursued at the expense of the others. Who can say, today, which can be neglected without running the risk of a radical shift in the world balance of power?

In a recent address, Secretary of Defense Charles E. Wilson said, "There are some who believe that the United States alone should match potential enemies plane for plane, man for man, ship for ship or in all these categories, regardless of the effect on the total security effort or the many other complexities in defense planning. This can easily lead to error. . . . Since our problems are quite different, our defense needs must be governed by more than Soviet statistics."

The achieving and maintaining of qualitative and quantitative superiority is not necessarily a matter of matching plane for plane, man for man, ship for ship.

All the men on the ground and all the ships at sea are second-line instruments in the air-atomic age. Such forces cannot exert true military power unless and until men of the air and weapons of the air have achieved military superiority in their medium.

To say that we need not worry about whether we or the Soviets possess the world's Number One air force at any given time would represent a significant shift in national policy. For it would mean, in effect, that we are lowering our standard of what constitutes an adequate deterrent force. For deterrence through strength it would substitute the idea of deterrence through hope.

Are we to believe that the Soviet Union has abandoned its dream of world conquest and world subjugation? Are we to swallow the current propaganda line that the dead Stalin is the sole Soviet villain and that the new collective dictatorship represents a bunch of nice guys trying to get along? Are we now to believe that the new set of gangsters in the Kremlin have suddenly acquired a regard for the sanctity of human life?

If the Kremlin's ultimate aims are unchanged—and who is bold enough to say they are not—we can only counter these designs with a decisive deterrent threat. And the entire concept of deterrence has always been based on

NEXT TEN YEARS?

By John F. Loosbrock
MANAGING EDITOR,
AIR FORCE MAGAZINE

overwhelming—not marginal—strength. If this does not obtain, if our deterrent strength is only marginal, then peripheral wars could be used to apply the knife of attrition to this slender margin. History has already taught us an object lesson in this regard. It was because our strategic deterrent was merely marginal in 1950 that General Vandenberg counseled against extending the Korean air war beyond the Yalu (AIR FORCE, July 1951).

To say that our own defense needs should not be governed by Russian strength is as dangerous as it is fallacious. Who would deny that the first crucial task of a war with Russia would be the defeat of the Soviet Air Force? Unless this were done, we would lose the decision. And the faster we win the air battle, the less devastation to our United States.

Because the task is so huge and complex, there is a temptation to look for easy and relatively inexpensive choices between weapons systems. But there are no easy choices, and we cannot settle for a little bit of each. We cannot neglect any of these avenues.

The Reds control the timetable. They can select their weapons systems and lay on "crash programs" to achieve them. The danger is that they can do this in areas that could be decisive. That's what we must guard against.

This brings us once more to the Strategic Air Command—its mission and its tools. Let us turn once again to the words of its commander, who cites these three cardinal facts.

"1. *The real threat* to our national security lies in a global nuclear war;

"2. The way to prevent global nuclear war is to be *undeniably and convincingly ready to win it without question;*

"3. The way to be convincingly ready to win a global nuclear war is to put our military money into the *right amount of the right kind of equipment and people.*"

The right kind of people, a major SAC concern, is discussed in detail beginning on page 46. It is the equipment which concerns us here.

We are told that we now have one operational wing of B-52s and it has been revealed that no more than four B-52s are being produced each month.

We do not know what Soviet Bison production was during this same period, but we do know that official statements have admitted they began equipping combat units with the Bison a full year before we began to "trickle" B-52s into our first wing.

Only last summer our present B-52 production plans were hailed as an "accelerated program." This "step-up" was reported in percentages, rather than in the more understandable and revealing terms of numbers of aircraft. When it became known that a paltry four per month was the "peak rate" at the moment, and seventeen per month the so-called "accelerated rate" hoped for in two years, any claims to production banners were pressed no further.

No one, in the military, in civil authority, or in industry, has said we couldn't step up B-52 production to a level that would assure us a renewed lead. We hope this will be done.

But we also hope that it will not be done at the expense of other vital elements of our airpower—or without assuring a growing effectiveness throughout the Air Force structure. It would be foolish to turn out more planes unless we had the skilled men to keep them flying. It would be inviting disaster to cram them onto a base system already jammed with billion-dollar invitations to a target party.

Accelerating B-52 production would magnify and aggravate another question. What will replace it as Soviet defenses continue to improve? The greater the step-up, the faster answers to this must be decided.

Will the B-52's successor be a supersonic jet? A chemically-fueled bomber? The nuclear bomber? How much of a substitute will the ICBM be? We do not suggest the answer. Indeed it may well be a combination of these. We only hope that by the time hordes of supersonic bombers appear over Red Square we will already have the answers.

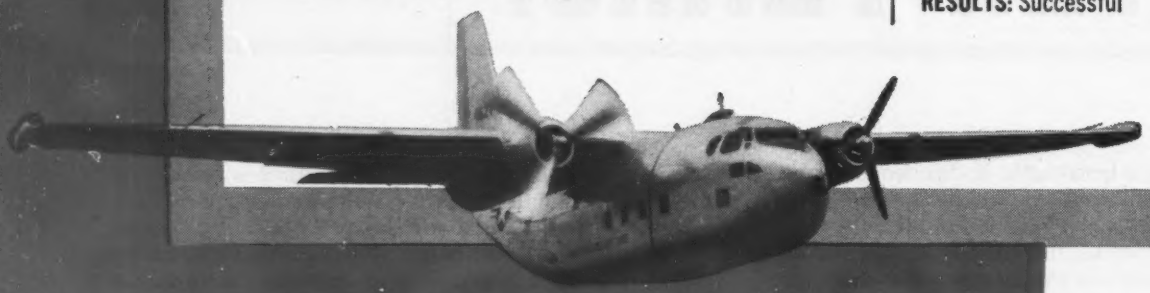
Our future requirements must also be weighed against great advances the Reds are making in another category of power—air defense. There are no reasons why their ability to turn out thousands of new fighters will lessen. There are no reasons why this same ability cannot be translated into other modern defensive weapons that will never appear in a May-Day fly-by.

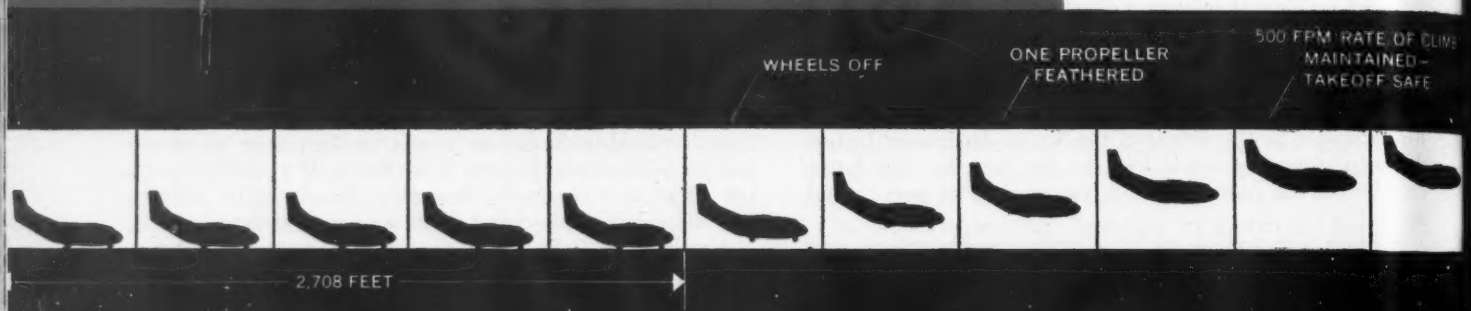
There is another real worry in all this. Eventually the news of Soviet advances will begin to seep into the minds of our combat crews. No one knows better than they the perils of attack against ever-improving weapons. They study these facts day after day. They watch the enemy's growth in size and efficiency in terms of their very lives. As our delivery systems slip behind, they will be the first to know. The assurance that they are on a winning team is not something the nation should fritter away by inaction. SAC's combat crews have accepted ever-increasing dangers, but how long will they continue to accept them if they see the nation letting their weapons performance advantages go down the drain—one by one?

As we said earlier, the problems of the force in being are not confined to SAC. They face the whole Air Force. It is a safe bet that the next decade of security through airpower will be more difficult to attain than the past ten years have been.—END

C-123 TURBOJET COMBINATION PROVES OUTSTANDING

MISSION: Combat Test Problem
WEIGHT: 13,000 lbs. Overload
TAKEOFF CONDITION: Power Failure
RESULTS: Successful





In a recent test for the U. S. Air Force, the Fairchild C-123 proved the value of thrust assist in meeting emergency single engine conditions!

A C-123 was equipped with two Fairchild J-44 jet engines and loaded to achieve gross weight of 66,742 pounds – *13,000 pounds overload.*

During takeoff and climb, both jets were operated to provide 2,000 pounds continuous thrust in addition to the two piston engines. At 2,708 feet, wheels were off the ground, and a moment later at a speed of 122 knots, one propeller was feathered!

From this takeoff position, the C-123 climbed out at 500 feet per minute – proving again its *big job capability and assault versatility*, heightened by jet augmentation to give extra power and extra safety in any emergency.

A Division of Fairchild Engine and Airplane Corporation

WHERE THE FUTURE IS MEASURED IN LIGHT-YEARS

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AIR FORCE
APRIL 1956

Ten Years of GLOBAL GUARD DUTY

On March 21, 1946, there were established within what then was the Army Air Force, three major combat commands, each designated according to its function. They were the Strategic Air Command, the Tactical Air Command, and the Air Defense Command. Thus all three have only just celebrated their tenth anniversary. The idea of continuously maintaining a combat-ready force in being on a wartime basis in time of peace had never before been attempted in the history of the nation. In these pages is told the story of how Strategic Air Command has accomplished this and thereby given this nation "A Decade of Security Through Airpower."

In great part the story is told in the words of men who participated in it.

—THE EDITORS

SAC

The present Commander-in-Chief of SAC is General Curtis E. LeMay.

SAC . . . Men With a Mission

By Ed Mack Miller

SHORTLY after 1900, Maj. Gen. Leonard Wood, USA, then commander of the Department of the East, was asked by a reporter if "areoplanes such as are now in operation could be used in direct attack?"

"Hardly," General Wood replied, "for the aeroplane, wonderful as it is, has simply reached a point as yet where it is able to travel with a minimum burden, at a comparatively low elevation, and for a comparatively brief space of time. It has not yet essayed to carry more than two persons, the mental and physical activities of at least one of whom are constantly engrossed in the task of manipulation and control. The aeroplane of today must have certain definite conditions to insure a successful start and successful alighting. As a factor in warfare the aeroplane has not yet demonstrated its utility."

"Some day," the good general added, however, "the aeroplane is likely to become a device that will have to be reckoned with."

General Wood was indeed more perceptive than another general who, years later while testifying before the Morrow Board in 1925, said, "I see no reason why the range of a military airplane should ever exceed three days' march for the infantry."

Fortunately, there were men of vision in the early years of the century, who clearly foresaw the tremendous impact strategic aviation would have on the history of the world—Douhet, the Italian strategist; Count Caproni di Taliedo, builder of the Caproni bombers of World I, who said, "No resistance is possible against the domain of the air"; and America's Brig. Gen. Billy Mitchell, who told the Congress: "Remember, gentlemen, that national defense in the next war will be measured primarily by airpower."

And nothing thus far has weakened

The first Commander of SAC was Gen. George Kenney, now an AFA Director.

the reply that Mitchell made to the House Committee chairman who asked: "Do you mean to say that aircraft will dominate all arms of defense?"

Mitchell's answer—"I mean that aircraft can go straight to their destination no matter where they may be. Nothing known at present can stop them."

The dropping of the atomic bomb by a B-29 on Hiroshima offered undebatable proof of the capabilities of the strategic air arm—and in so doing vindicated the foresight of its proponents.

This devastating strike brought about the first capitulation of a major enemy homeland without full-scale invasion by ground troops, thus saving the lives of thousands of Allied soldiers, who were even then on the Japanese doorstep, poised for the traditional invasion.

Strategic bombing as a tactic of war came to fruition in World War II. One of the pioneers of the new type of warfare was Gen. Carl A. Spaatz, later to become first Chief of Staff of the USAF. General Spaatz commanded the Eighth Air Force during its formative days as a strategic bombing unit. He later became commanding general of the US Army Air Forces in Europe, heading the combined Eighth and Fifteenth AFs. This was in 1944, when Lt. Gen. James H. Doolittle, who earlier had headed the North African Strategic Air Forces, was commander of the Eighth Air Force.

After the huge and powerful air forces of the US had helped whip Hitler, General Spaatz took over command of US Strategic Air Forces in the Pacific, and from his headquarters on Guam oversaw the final devastating aerial assault on the Japanese homeland.

Here one of his top commanders, as head of the Twentieth Air Force and later Spaatz's Chief of Staff, was the man who now heads the USAF's Stategic Air Command.

Curtis E. LeMay, a native of Columbus, Ohio, and a graduate of Ohio State University with an engineering degree, received his pilot's wings in October 1929. Before becoming our top B-29 commander, he had served under Spaatz in Europe. He commanded the 305th Bomb Group, one of the First USAF bombardment units to enter European combat, and pioneered numerous strategic bombing tactics, including the straight-in bomb run and formation pattern bombing.

He initiated the lead crew system whereby all planes on strike were guided by one crew and developed a new bomber combat formation which cut combat losses throughout World War II. General LeMay led the 1943 shuttle mission of Flying Fortresses from England to Regensberg, Germany, and in August of 1944 was given the 20th Bomber Command, where he used techniques developed over Europe to increase the number of B-29 raids in the China-Burma-India Theater. Other Pacific area assignments followed, including command of the Marianna-based Twentieth Air Force, and General Spaatz's Chief of Staff until September 1945.

After the war he served as Deputy Chief of Air Staff for research and development. From October 1947 to October 1948 he commanded United States Air Forces in Europe, where he began the Berlin Airlift, after which he returned to the US, taking over the Strategic Air Command in October of 1948.

A vast communications system lets SAC commanders stay in touch with their planes around-the-clock, around-the-world. Above, teletypes at Offutt AFB.

LeMay, the man, is a dedicated airman who thoroughly learned the lessons taught by General Mitchell, Arnold, and Spaatz. A matter-of-fact person who does not easily tolerate small talk or small ideas; he dislikes speeches and publicity. His life is in the Air Force and SAC.

Although those men close to LeMay say that too much fiction has already been fabricated about the SAC Commander-in-Chief's cigar-in-jaw toughness (they say he is a pretty regular fellow who has the sense to know that in his world-guarding job he must be without feelings or sentiment or fear), they admit that in fulfilling his mission, Curtis LeMay has had to be as hard as the job that faced him in building the world's greatest aerial deterrent force, the Strategic Air Command.

"At our bases," he has said, "there is a certain urgency in our operations. That is because the training in this command must simulate combat conditions as accurately as possible. The continuing job of all of us, whether airman or officer, is to use the resources we are provided to give the nation full value in combat capability. Our nation's air strength always must be kept great enough to maintain peace by discouraging global war—or in the event of a war, strong enough to discharge its mission effectively.

"In the event of war, the long-range bomber and the nuclear weapon enable us to carry to an enemy's heartland the greatest destructive power the world has ever known. The airplane can reach over and beyond the masses of manpower the Communist world has mobilized behind the Iron Curtain.

"It is the only means by which we can bring our full power to bear directly against his muscle and heart. As long as we maintain superior air strength, we will probably never have to use it."

When SAC was activated in March of 1946 at Bolling Air Force Base, Washington, D. C., its first commander was Gen. George C. Kenney. Then SAC had only three jet planes—Lockheed P-80s. Its total manpower was about 37,000 persons. It had a total of 600 planes, of which 250 were obsolescent bombers. Under its command were eighteen active bases.

Now, ten years later—ten years in which the growth of SAC's power has unquestionably been the prime deterrent to Soviet aggression—the Strategic Air Command can list some proud accomplishments. It now has more than five times the number of personnel it had ten years ago (and its critical problems today are centered in long-term retention of the best). It also has five times the number of planes it had then—and most of them are jets, ranging from nuclear-bomb-carry-

(Continued on following page)

ing fighters to the world-spanning B-52. SAC now has more than thirty bases in the US and more than ten overseas operating bases, and is ready to go at any time—when, as the men of SAC say, "the whistle blows."

General LeMay wants the world to know his boys are good but like every other sensible citizen, he doesn't want a showdown if a showdown can be averted.

The world of SAC is controlled from Offutt Air Force Base at Omaha, Nebr., where General LeMay keeps C-97 command transports in constant readiness for quick inspection trips to any part of his far-flung domain.

That domain includes three major subordinate commands and three air divisions: The Second, Eighth, and Fifteenth Air Forces in the continental US; the 3d Air Division on Guam; the 5th Air Division in North Africa; and the 7th Air Division in the United Kingdom.

The fifty-one wings in the command train constantly, with an atmosphere of wartime urgency governing all their actions. Through a vast system of global communications, SAC measures its efficiency in its ability to get in touch with a single plane flying anywhere in the world.

And if it takes longer than twenty minutes to contact him, there may be a little hell to pay.

For Commander LeMay must figure that if he can't reach all of his outfit, wherever they may be, in that length of time it may be too late.

When SAC was organized ten years ago, gobal capability became its primary objective, and the combined brains of American scientists, industrialists, flyers, and statesmen pushed toward it from several directions.

The first was foreign bases. As SAC moved its big planes across the oceans in the years following 1946 and found bases close to the periphery of Soviet territory from which they could operate, its dynamic character began to take shape.

The second way took a leaf from Norse mythology. The eldest son of Woden, king of the Norse gods, was Thor, a strong, brave, and kind warrior who wore iron gloves (like the one on the SAC crest) and a belt of strength around his waist. His chariot wheels made thunder as he rode through the sky, and in his strong right hand he held the strongest weapon of all—his magic hammer, which would return when thrown.

SAC's second answer then, to the problem of deterring an enemy who lived across the world, was a mighty bomber, the B-36. It could carry enough fuel so, like Thor's hammer, it could do its work of combat and still fly back to its master *(see page 82).*

They called the B-36 the "Peacemaker" because it was the big deterrent in America's peace policy in the years after 1947. It helped build a belt of strength around the globe and, like Thor's chariot, its sound of thunder made the men who might have toppled the world into a bath of blood think twice.

The B-36, with its six conventional and four jet engines, a range of 10,000 miles, an altitude capability of above 40,000 feet, and, at reduced range, a bomb capacity of forty tons, became a high-flying symbol of security. The B-36 will be replaced in the SAC program over the next several years by the newer all-jet B-52.

And, although it may have never dropped a bomb in anger, no one will be the sadder, for it will have accomplished its mission perfectly—as a world-spanning Peacemaker, flying its beat in protection of the rights of free men.

The third method developed to assure that SAC crews could bomb anywhere in the world and still return to home base was aerial refueling of medium bombers *(see page 73).*

Of course, none of these advances were made without much trial and more error. But in the face of a driving necessity for a boomerang bomber force, the men of SAC have done much since 1946.

The "global mobility" aspect posed many headaches, because to move an entire combat unit, complete with everything from spare engines to spark plugs—and do it on an hour's notice—is no mean trick. But constant planning and training have given a pattern to the operation so that now SAC bosses can almost time the entire business with a stopwatch, even to the point of prescribing that the equipment be set up on arrival within a specified number of hours.

Planes and equipment are maintained in a constant state of readiness. Essential unit equipment—the minimum immediately required for short-term operation at a forward base—is packaged and ready to go at any time.

Flyaway kits, or aluminum bins on casters, are packed with critical aircraft spares for quick hoisting into bomb bays and movement to forward areas. These kits always accompany combat aircraft on foreign rotations and will support a wing for thirty days of operation.

For overseas TDY, flyaway kits carry enough spare parts for thirty days.

In addition, personnel are always ready. All medical inoculations are kept up-to-date. Those whose jobs require special tools, such as radio and radar technicians, have their own flyaway kits packed and ready to go at all times.

When the order comes, an entire wing – planes, crews, maintenance parts, and records, as well as support planes and personnel—is soon in the air, moving quickly to forward bases. Only a few items and a few people are left. Large and heavy types of maintenance equipment which combat aircraft cannot carry are handled either by SAC's own cargo airlift capability in C-124s or by MATS planes which also move critical personnel who can't be taken in the combat planes.

General LeMay says, "Moving an entire combat wing is comparable to picking up one of our major domestic airlines, moving it across an ocean, and putting it back in operation all within a matter of hours. This is now accomplished as a routine training deployment."

Since actual experience is the most realistic form of training, each SAC combat wing conducts annual maneuvers as a unit at an advance base. This training outside the US is usually for a three-month period, and SAC crewmen quickly become familiar with the geography, customs, and operating conditions in different parts of the world.

SAC mobility is continually demonstrated as wings deploy from US fields to advance bases in foreign lands as part of normal training, often crossing each other's path of flight as the armadas switch bases. Jets and prop-driven aircraft take part in the mass flights across the oceans of the

world, and fighter aircraft, such as the F-84G *(see page 108)*, cover almost the same distances on their non-stop missions.

General LeMay and his commanders have tried to think of every angle in the "quick-haul, bomb-drop business." And they have found the best way to train is to consider every day M-Day and every hour Zero-Hour.

With the B-50 already long since retired and the B-36 playing out its last years of service, the SAC arsenal is moving into the pure jet field rapidly.

The workhorse of LeMay's command now is, of course, the B-47 Stratojet, that beautiful, sweptwing, tall-country tiger that has been such a good airplane that its crew chiefs say it's like maintaining a B-29 without engines *(see page 90)*. Powered by six General Electric J-47 turbojet engines, the B-47 is in the 600-mph class and has established several impressive time and distance records. Its range with in-flight refueling is restricted only by the endurance of the crew. Larger than the heavy bombers of World War II—its wings span 116 feet and its fuselage measures 106 feet and eight inches—the B-47 is manned by a crew of three. All SAC medium bombardment and reconnaissance wings are now equipped with B-47s.

SAC's "Big Bertha" is the B-52 Stratofortress *(see page 99)*. The jet-propelled B-52 possesses the greatest combat potential ever built into a US Air Force heavy bomber. Designed to cruise at over 600 mph for 6,000 miles without refueling (it can, however, refuel in the air, too), it weighs as much as 120 automobiles. It is big, with wings long enough to span the width of a football field—plus twenty-five feet. It is powerful, with eight Pratt & Whitney J-57 jet engines producing the power of thirty diesel locomotives. And it is so fast that few jet fighters can match it at altitude.

Designed to meet exacting requirements of Strategic Air Command's long-range operations, this newest heavyweight is being delivered to SAC as rapidly as the ships are produced, which is not nearly rapidly enough. The first of the B-52s was delivered in June 1955.

Ultimately to replace the Republic F-84F fighters will be the F-101A Voodoo, developed by the Air Force in conjunction with McDonnell Aircraft Corp., and designed to meet SAC requirements for a long-range strategic fighter. The most powerful US aircraft of its type, the Voodoo is supersonic and can be refueled in flight. It is capable of carrying nuclear weapons.

Coming along as a replacement for the workhorse Boeing KC-97 tanker is an advanced version of the Boeing 707 jet tanker-transport now in production for SAC. The Air Force has designated its first jet tanker plane the KC-135 Stratotanker. The KC-135 will be used to refuel both the B-52 and the B-47, adding greatly to the strike potential of the sleek bombers.

A 707 prototype already has demonstrated its ability to refuel the B-52 at high speeds and altitude, which means that the fast jet bombers won't have to drop to low altitude and low airspeed to refuel, as is the case with the KC-97 "flying gas station." In flight tests conducted by Boeing the aircraft has frequently cruised at altitudes higher than 42,000 feet and at speeds greater than 500 miles per hour.

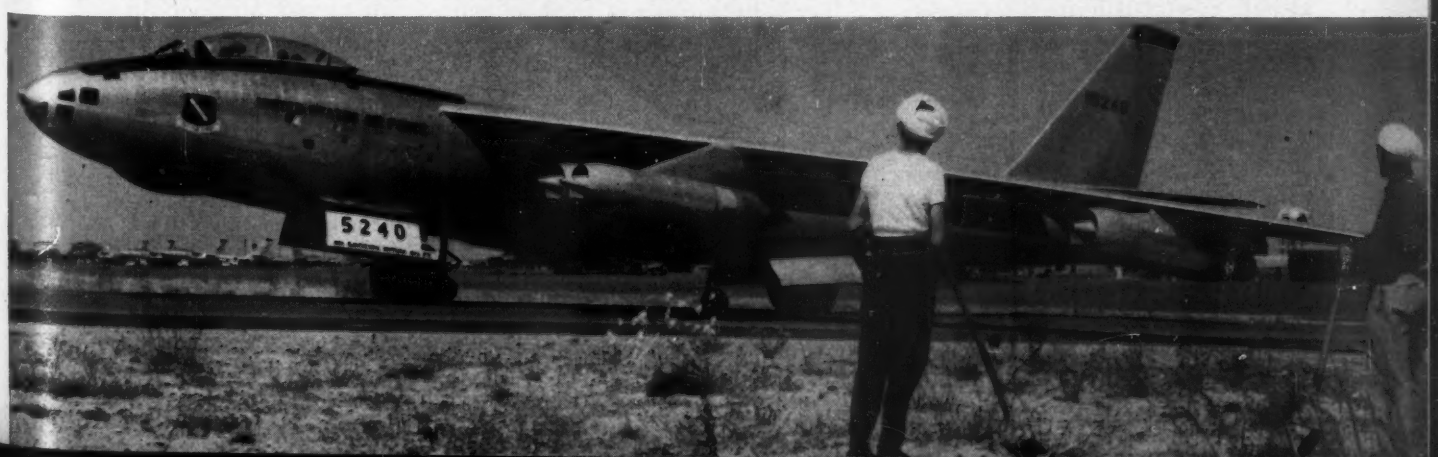
The big baby in the hauling department remains the Douglas C-124 Globemaster II, largest production transport in the Air Force. It is used by SAC to perform a variety of long-range cargo missions all over the world. The heavy-duty carriers are capable of speeds around 250 mph and have a range of up to 4,000 miles. They make up the strategic support squadrons which give global logistic back-up to SAC combat elements.

The improvement of aircraft types

(Continued on following page)

Last year for the first time a B-47 won the spirited competition of the "SAC World Series." The top crew included Lt. Cols. Traylor, Speiser, and Holguin.

Today, it's routine for SAC to transfer a whole wing to an overseas base. Here's a B-47 landing in North Africa.



will, of course, make SAC less dependent on foreign bases when newer and bigger planes, truly intercontinental bombers like the B-52, become available in really adequate numbers.

This is not to say that SAC should give up any of its advance bases. Although die-hard isolationists shout that it is the logical thing to do, common sense dictates that fighting a war from US bases with medium bombers should be the last resort.

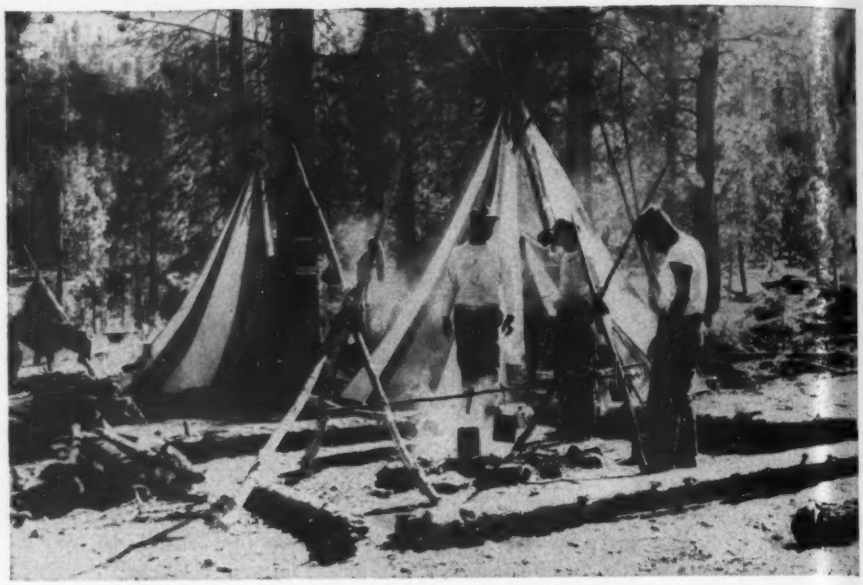
SAC is in the hauling business, and a short haul is always more efficient than a long one. The turn-around time is doubled or more, and so, in a given period of time, less destructive force is placed on the targets.

Another advantage in substantial numbers of foreign bases is that, in addition to complicating his problem of effective action against the US, it gives the free nations greater flexibility in that they know that the Communist is going to be able to get a relatively much smaller portion of bases —so that we, therefore, have many more to operate out of, which gives us many different approaches to the target area.

The problem of defense posed to the Soviets, then, is tremendous. They know that jet bombers can come from all directions; so they have the problem of moving their fighter force, and setting up their static defenses, their missiles, and their flak so that they can defend themselves efficiently. Obviously, they would be spread quite thin if the US has a vast number of advanced bases. Of course, there is little intelligence available on the enemy defensive force. It is known that they have good fighters in abundance, and that their force is improving rapidly in quantity and quality. Their radar may be good, too—but, as General Mitchell said: "You cannot stop a determined bombing attack once it has started." You can punish it severely, however, and attrition is another SAC headache.

The men of SAC are the best bomb-droppers in the world. Their test missions are deadly serious. On the ground, every bomb run is accurately charted with electronic devices by a radar bomb-scoring detachment so that accuracy can be proved—and improved. Planes from SAC bases are in the air each day, each night, week after week—roaring along at better than 600 miles per hour as crews go through all the procedures they would use on an actual bombing mission in war.

Weather makes little difference. In actual combat, planes and crews would fly their missions regardless of weather conditions. So SAC continues its missions in rain, fog, snow, windstorms, and clouded visibility, day and night, for with radar bombing equipment, it's not necessary to see the target to bomb with accuracy—and war might occur in any weather.



SAC figures tough, realistic training prepares its men for emergencies when they do happen. Above, crew members at AF Survival School, Stead AFB, Nev.

Flying at altitudes of eight miles or higher, each bomber heads in on an American city. Then an observer presses a bomb release button. Another target is theoretically destroyed and a SAC crew has carried out a bombing mission realistically similar to one it might someday have to fly against an enemy. For the crews, this is routine.

Each year industrial targets in almost every American city with a population of more than 25,000 are theoretically destroyed by SAC planes. San Francisco alone has been the target for 495 attacks during one month.

Once each year, top bomb-teams are tested in the annual Bombing and Navigation competition, a tense week-long duel which crews have dubbed the "SAC World Series."

The main concern of bombing and navigation training—and the annual meet—has been to step up accuracy. Every year has seen an increase in over-all accuracy until today SAC planes can bomb with precision well within the limits of their weapons from high altitudes.

The competitions have generated a great deal of interest, have aided in development of new techniques, and have served as proving grounds for planes, men, and equipment.

The coming-of-age of the B-47 is a good example. Up to 1955, piston-engine planes like the B-36, had taken most of the honors. Some critics or skeptics doubted that a high-speed jet could match the accuracy of the big, more stable platform.

But their case was smashed in '55 as medium bomber crews from B-47 wings swept the competition. Their victories formed a definite cleavage separating the jet-bombing age from the World War II era. With giant B-52 long-range jet bombers now coming into the command, the world can expect strategic air to rely on jets completely in the near future.

In 1952, Strategic Air Command also inaugurated the annual SAC Reconnaissance and Navigation Competition as a means of promoting competitive spirit and determining the capabilities of reconnaissance wings and crews.

Every reconnaissance wing is represented in the yearly six-day meet. Each crew runs day and night celestial navigation missions, radar target photography, aerial target and photoflash photography.

At present Strategic Air Command uses the RB-36, the RB-47, and RF-84Fs as its reconnaissance planes. The first two are stripped-down versions of bombers with the same numerical designation, while the latter is a reconnaissance counterpart of the F-84 fighter.

The combat crews in SAC are about the best in the business. The average officer on a select or lead crew is thirty-three years old, and the average airman, twenty-seven. SAC has a

fairly unique system in the selection of leaders. Crews are rated as "Select," "Lead," or "Combat-ready." Select and lead crews have demonstrated a capability higher than their colleagues, and represent the cream of the force. Naturally, they draw the most difficult and the most important targets.

To become a select crew, a flight team must meet certain standards in training. When it does, everybody on the crew gets a spot promotion—everybody goes up one rank. They hold that spot promotion just so long as they retain their efficiency. If performance drops below the standard, they immediately go on probation, and within a matter of three or four months, they are given rigid tests in all phases. If they do not measure up to select crew standards, everyone loses his promotion.

Lead crews actually are usually as good as the select crews. However, there are only so many promotions, and SAC can't promote everybody. If a select crew falls below the standard, then a lead crew will move up to replace it, and assume the new designation of select crew.

The combat-ready crews, which make up the majority of the force are usually not far below the bombing capability of the two top categories. All can bomb well within the limits of the weapons they are using.

Select, lead, or combat-ready, they're the finest airmen in the world.

Recently Mr. Rex Madeira, sales manager of the Spartan School of Aeronautics in Tulsa, Okla., told this writer: "The Strategic Air Command constantly amazes me. It has one of the best systems of business practices I have ever seen inside or outside the military."

The compliment had its base in fact. When Curtis LeMay took over SAC, he appointed a committee of officers to investigate the business methods of major US civilian businesses. From each he took the best practices he could find and shaped them to fit SAC's operation.

The command's Management Improvement Program is considered a model of its type, as is the famed "SAC Rating System," which is so thorough that IBM cards are kept on every man in the command. Every individual performance shows up for what it is.

Management boards give instant visual checks on the "in-commission" status of SAC's arsenal of aircraft—and if the readiness graph dips below the acceptable combat potential line, things really start buzzing until the trouble is remedied.

Another objective of the management program is the education of workers, supervisors, and executives in sound operating principles. This is accomplished by seminars, base management indoctrination courses at every installation, NCO Academies, commanders' financial management courses, and other special training.

SAC fully exploits industrial methods in work measurement, production control systems, human relations research, and the best thinking of the universities in assisting it in many ways.

Top management officers consistently apply modern techniques to command problems. Command representatives attend meetings of the Society for the Advancement of Management and other professional groups to assure that no new development is overlooked.

The problems of the Strategic Air Command are, of course, many and complex. Its biggest headache is the continuing loss of trained manpower to industry—this is the weakest link in an otherwise strong chain *(see page 46)*. There are community relations problems always nagging at the commanders. The jet noise problem is always a thorny one, and the increasing speeds of SAC planes has brought on burdensome high-altitude traffic control problems in weather. On any one of a hundred fronts, running a global "hauling" business is no picnic; but then the hard core of men of SAC are no ordinary men, either.

Neither is working for Curtis LeMay & Company an easy job. The grumblers and the goldbricks in SAC are soon sharpened up. But that is not to say that the good soldiers do not grouse. They do, many of them. Some would like to get out of SAC, they say. It's too hard on their families, their being away so much. The pay isn't commensurate with the danger of flying fast jet bombers and fighters. "It'd sure be nice to just have to put in forty hours a week and then settle down to a little golf and gardening" is a phrase some SAC men have been heard to mumble. In fact, you always get the worst from a SAC airman first. Then slowly, the good comes out. And pretty soon you are getting the business that is known as being "SAC-indoctrinated." You find out that these men, under their curtain of callousness, are pretty proud of everything about the job SAC does.

Looking into SAC's future, the next step in the natural progression of our weapon spectrum would be fully intercontinental-type bombers, completely independent of air refueling or forward bases. Following the intercontinental bomber SAC will probably gradually phase into missiles, but only when the Intercontinental Ballistic Missile can meet the accuracy, yield, and reliability of the long-range nuclear bomber.

But along with the development of the ICBM, bomber leaders warn that the intercontinental bomber development must not be relaxed—until it is certain that the ICBM can do as good or better a job. These experts are worried that present preoccupation with "push-button" warfare might delude many people into letting our present force in being deteriorate before an adequate substitute is tested, poised, and ready. This, they say, could be a serious threat to our continent and the Free World.

Not that SAC is in any way opposed to a crash program for the development of the ICBM. It is a strong supporter of such a program. SAC men say with emphatic sincerity, that they'll be only too glad to get an instrument that will help do the job without their getting shot at. And who can fight that kind of reasoning?

Just as long as we continue our development program so that the SAC arsenal can fly faster, higher, can carry bigger bombs than Soviet aircraft, there will be peace. Even if the day comes when the Soviet force and the US force are equal in capability—providing that the US force is continually modernized and dispersed, SAC will still be an effective deterrent, and seems to be the best if not only means of preventing war.

This, of course, involves the "force in being" concept, the concept whereby men and machines are poised and ready to go at any time. It is entirely possible that from now throughout the course of civilization it may be necessary to maintain a deterrent force on this status. No one likes to live that way—no one likes to pay the bill, but it will be a necessity unless some means of guaranteeing a lasting peace other than the deterrent force is hit upon.

That is why it is said of SAC that its greatest victory will come if war never occurs between the two great powers in the world today— Communist Russia and the United States of America.—END.

Ed. Mack Miller is a free-lance writer and a captain in the Colorado wing of the Air National Guard.

SAC's planes and pilots are the world's best—but can't do their job without trained technicians to keep them flying.

SAC

Trained Technicians

SAC's Achilles Heel

By John G. Norris

PINECASTLE AFB, Fla.—Dawn is breaking as your B-47 leaves the runway. As the airplane levels off upstairs, you get out of your parachute harness, hook on an oxygen bottle, and crawl to the bombardier-navigator's post in the nose.

1st Lt. Glenn F. Morgan, Jr., gestures at the radar scope. The instrument is the main element of the airplane's "K-system"—the "magic black box" that makes it possible to bomb individual buildings accurately from above 40,000 feet through darkness or clouds. Both of you fasten your oxygen masks so that you can talk on the intercom.

The thirty-two-year-old bombardier-navigator-radar operator — misnamed an "observer"—explains that the B-47 is turning to start its visual bombing run. From the pre-flight briefings, you know that this seven-and-one-half-hour training mission simulates an actual nuclear attack on an enemy target thousands of miles across the world.

That includes flying a precision point-to-point course back and forth over the Southeastern states, navigating by the stars; a rendezvous with a tanker plane for in-flight refueling; actual visual bomb drops of 500-pound conventional bombs to make sure the release mechanism works; and—the climax—the radar bomb run on the main target.

At lunch the day before, Col. Mike McCoy (*see page 90*) introduced you to the bomber crew. He told you that it cost the government $616,000 to qualify one B-47 pilot. You believe it.

Capt. Edward J. Albers, 34, the co-pilot saw extensive World War II service, like Morgan. Both were recalled when the Korean war broke out. The aircraft commander, Capt. John W. Rosenbalm, 27, had served in the Air Force continuously since becoming an air cadet after the war. A typical B-47 crew has an average age just over thirty, each is married and has a child.

You wonder what keeps the three top-flight men—still Reservists without assurance of an Air Force career—on the job. Then you recall what General LeMay had said about his "dedicated" people.

Rosenbalm asks if you'd like to fly the airplane and gingerly you take Albers's seat. The bomber handles like your Buick. Then comes the approach to the target. Not Moscow, but Charlotte, N. C., where there is a radar bomb-scoring squadron, able to tell just where the B-47's load would land.

Morgan starts his bomb run, eyes glued to the radar scope. Countless hours of study of aerial photographs, he hopes, will enable him to pick out the obscure target through the clouds.

Morgan's major problem is target identification. His target is unidentifiable on the scope, so he aims for some oil tanks a known distance away. He sets the "black box" for such "offset" bombing and adjusts for wind, speed, altitude, etc. The electronic brain should do the rest.

But the "black box" fails. Only one of the many instruments goes out—the true speed indicator—but it is enough. Morgan squeezes past you and checks his equipment. Finally he fixes it. But it is too late. The mission is an "abort."

Some green airman mechanic had failed to adjust a set-screw properly and an overworked sergeant-supervisor had missed it. So the combined skills and efforts of the men who built the plane and base, planned the mission, readied the plane for flight, and then flew it well, all came to naught.

You begin to appreciate what had been stressed so strongly during the briefings here and at SAC Headquarters in Omaha—the grave shortage of skilled mechanics and the exceptionally high turnover of newly trained technicians. Too many B-47s are temporarily out of operation each day because of mechanical difficulties. Too many training missions cannot be completed satisfactorily because something goes wrong in the air.

What was it General LeMay had said?

"The situation is critical and is our chief worry today. We still can carry out our mission, but at a high cost in efficiency and effort."

Already, the manpower problem has seriously lowered the combat readiness of the Air Force's long-range nuclear striking arm. It represents an ominous weakness in the nation's defenses today. For if one small but vital element of SAC's vast, complex, fighting machine breaks down, the end result could be catastrophic.

For the most part, SAC combat crews today still are experienced and fully qualified to do their job. But the experience and skill level among SAC maintenance crews is low. Ninety-one percent of all SAC enlisted airmen have been in the command less than four years. One day, a wing at one base had nearly a

(Continued on following page)

third of its B-47s out of service due to K-system maintenance because of a lack of skilled technicians.

This is terribly costly both in dollars and in efficiency. SAC represents a tremendous investment—$8 billion worth of planes, bases, and other property alone. It costs $1 billion a year to operate, plus several additional billions for new planes and bases. The nation has $724 million dollars invested in each B-47 air division—counting trained personnel, planes, bases, and equipment.

During the last fiscal year, 1,900 SAC officers and 35,800 airmen left the service. SAC figures it had $777 million invested in them. That represents the cost of replacing them in their various specialties, including recruiting, training, paying, and supporting new people to bring them to the proper skill levels to do their jobs.

Foreseeing this loss, the Air Force last year had to start pumping in new people to replace them. The Air Training Command provided SAC with 12,000 basic airmen at a cost of nearly $20 million, 12,600 apprentice mechanics at a cost of $31.5 million, and 4,500 technicians, returned to schools for advanced training at a cost of $24 million.

In addition, SAC itself had to conduct on-the-job training to up-grade 67,000 airmen to fill the vacant specialties. SAC estimates that this cost $52 million, because scarce supervisors and skilled technicians had to be pulled away from their regular work to train them, and the trainees were unproductive during this period.

The *initial* cost last year to start replacing the 35,800 sergeants and airmen who left the service during that period, therefore, totaled an additional $127 million.

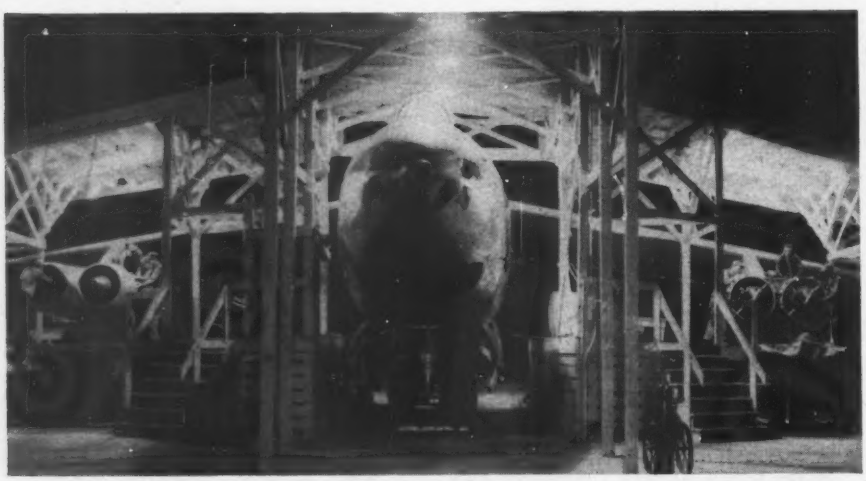
SAC is hurting most today for more skilled maintenance men like these.

But the money aspect is relatively unimportant, as a detailed comparison of four B-47 wings shows. It was made to determine the precise effect of inadequately trained ground crews on the operational capability of combat units. All four were "combat-ready," and 100 percent manned.

Two of the wings were SAC's best-staffed units, being eighty-five percent "effectively manned" in the airmen technical skills. The other two were at the bottom, from a ground-crew standpoint, being only sixty-six percent effectively manned in "hard-core" skills.

The poorest-manned units were able to keep their B-47s in the air only eighty percent of the time they were supposed to. They completed eighty-seven percent of their training missions, only seventy-five percent of them satisfactorily.

On the other hand, the two best-manned units flew ninety-nine percent of their prescribed flying hours, completed ninety-eight percent of their training minimums, and ninety-one percent of these were acceptable to LeMay's rigid standards.



Maintenance in SAC must not only be top-notch; it must go on round-the-clock.

It cost the two poorest-manned wings $468 per flying hour to operate, and the two best, $415.

But the real payoff came in the vital quarterly "Unit Simulated Combat Mission." The two poorest-manned wings were twenty percent less effective in this big test of combat capability than the two units with the best ground crews.

"In other words," said a SAC officer, "under wartime conditions, scratch twenty percent of the targets assigned to the two wings with the less skilled ground crews."

Why is the Air Force so pressed by the lack of a relatively small number of technicians? Take the "black box," for example. In the first place, it takes a man with a fairly high IQ to be accepted for the K-system basic training school. Yet the Air Force has to take all sorts. It takes about two years of school and on-the-job training to advance such a man from apprentice to mechanic rating. During their fourth year, after advanced schooling, some gain the skill for upgrading to technician level and promotion to staff sergeant. By the end of the four-year enlistment, the Air Force will have spent $22,500 on such a mechanic in training, pay, and allowances. It will have received eighteen months' productive service from him, and given him two-and-one-half years of highly marketable training.

If he reenlists, it costs the government $20,500 only for his pay and other maintenance for the next four years, and SAC gets full value received—ninety-two percent of his time in productive effort.

But only twenty percent of the "black box" men are signing up for a second enlistment.

Why do they leave?

An airman first class says he wants to go back to college when his four-year enlistment expires.

An airman second class says he plans to marry and get an engineering degree under the GI Bill.

Service newspapers are full of ads reading, "Leaving the service? See us."

Turnover in other key aircraft maintenance fields is as critical as among men servicing the black boxes. Lt. Col. Edwin J. Caudill, 813th Air Division personnel director, is concerned about his mechanics. His questionnaires show that 121 of 306 plane mechanics are eligible for discharge in June and July and only sixteen say they will reenlist.

Pinecastle AFB has only sixty per-

(Continued on page 51)

Salute to America's global "keepers of the peace"!

At this very moment, miles above the earth, dedicated crews of the Strategic Air Command are boring through silent space on precision, combat-ready training missions. Some are high over a polar icecap, or far out over the oceans. Other SAC crews, and their jet bombers, are poised on American and overseas bases, ready for instant action.

At any moment, day or night, SAC's training operations can be changed into combat operations, unleashing mighty retaliatory nuclear strikes against the war-making power of any aggressor, anywhere.

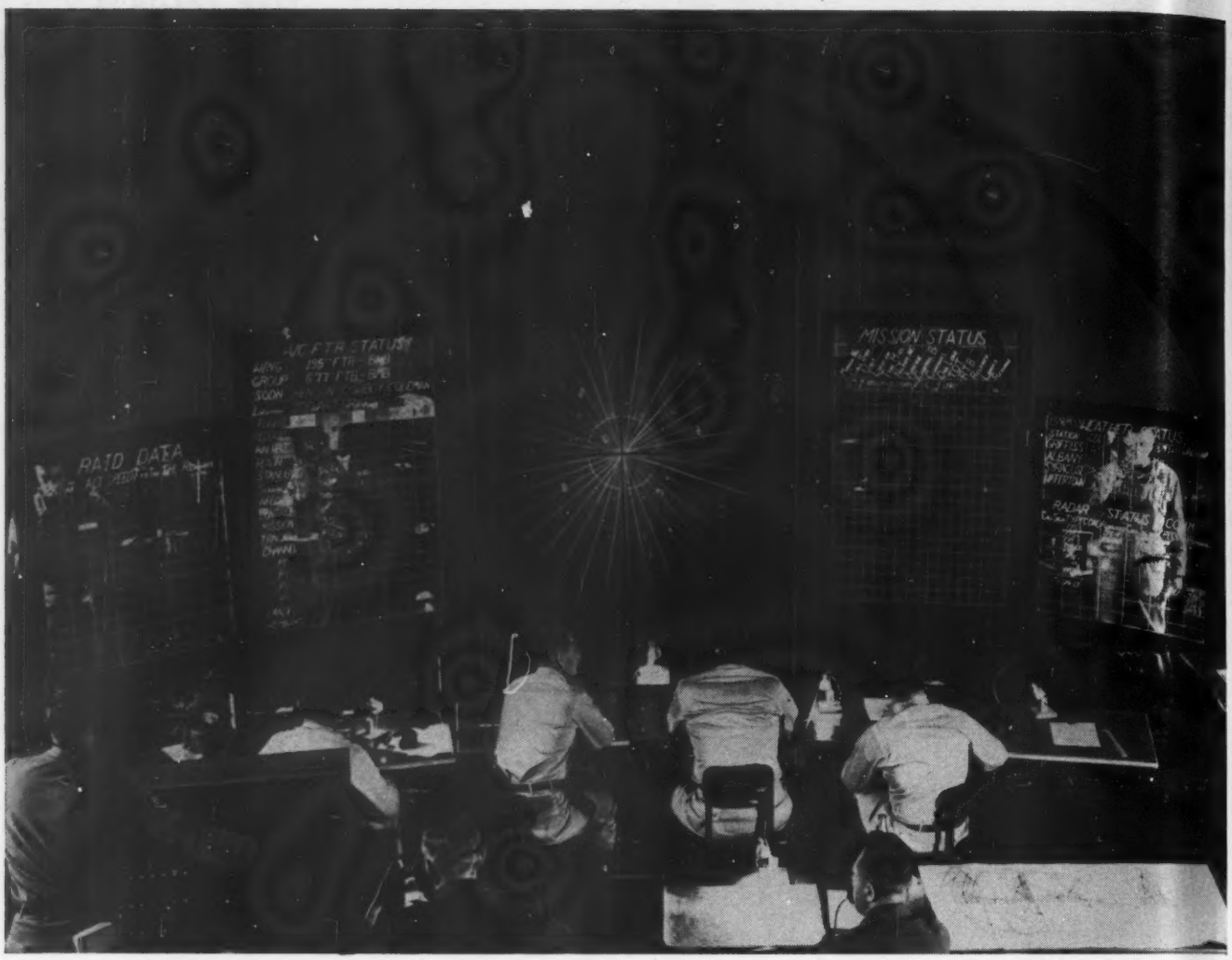
As the potential wielder of this massive force, Strategic Air Command has, since its founding ten years ago, functioned as the free world's "keeper of the peace."

To maintain this great force on the keenest edge of readiness, SAC crews—ground and flight—operate around the clock on a combat alert basis. Flights and missions follow split-second timetables. Entire wings, accompanied by aerial freighters and tankers, are rotated in regular training operations to bases in England and North Africa.

Last year, Strategic Air Command's keepers of the peace flew over 100,000 individual missions, totaling more than 1,000,000 hours of flying time.

On this 10th anniversary of the founding of SAC, the men and women of Boeing join a grateful nation in saluting the men of the Strategic Air Command. Boeing is proud that, over the decade, it has been privileged to work as a partner, designing and building SAC's tankers and bombardment aircraft. The Strategic Air Command's Boeings range from its first B-29s and B-50s to today's rugged KC-97 tankers, swift six-jet B-47 medium bombers, the eight-jet B-52 intercontinental bombers and the KC-135 jet tanker-transport now under construction.

BOEING



Official U.S. Air Force Photograph

Friend or foe? Tactical defense officers in MINK control center watch movements of aircraft as reported from radar warning sites. This is equipment developed under the direction of Rome Air Development Center.

ROME AIR DEVELOPMENT CENTER PROVIDES AIR DEFENSE EQUIPMENT FOR OUR AIR FORCE

One development agency for the Air Force's ground-based electronic equipment is Rome Air Development Center, located at Griffiss AFB in Rome, N. Y. One of the ten centers of the Air Research and Development Command, RADC is concerned with the air defense of our nation, with providing equipment for tactical supremacy, and with developing ground complexes for various navigation systems to aid all aircraft. In addition, RADC is charged with data handling improvements for the Air Force intelligence mission.

RADC is the responsible center for development, through its various contractors, of such end products as radar sites, including improved tubes, circuits, antennae, and shelters; ground communications equipment and associated support items; IFF (Identification Friend or Foe) environments, and electronic countermeasures.

Bringing complex systems from the written requirements to the actual hardware items to be used in the various Air Force commands is a long and tedious business which draws upon the skills of RADC's 500 civilian and military engineers and their many counterparts in private industry.

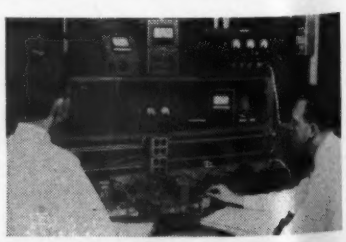
84

FORD INSTRUMENT COMPANY

DIVISION OF SPERRY RAND CORPORATION

31-10 Thomson Ave., Long Island City 1, N. Y.

This is one of a series of ads on the technical activities of the Department of Defense.



Engineers at Ford Instrument Company working on a special Air Force project in one of the company's laboratories.

SAC uses many means to boost the morale of its people. A spot of deep-sea fishing in Florida is always popular.

SAC flying clubs have played an important part in a sizeable hobby program. At left, one group of enthusiasts plans a cross-country weekend flight.

cent of its authorized instrument maintenance men. By mid-April, this will drop to fifty percent. Of an authorized fourteen men to maintain its IBM machines, a vital factor in mission planning, only ten are assigned and but three of these are "effectives." Only one out of the four comptometer repairmen allowed is "on board."

The Air Force makes a strong effort to sell airmen on reenlisting. All airmen are interviewed on their future plans. Armed with full data about the cost of living, wage scales, etc., in the airman's home town, the interviewing officer stresses the advantages of an Air Force career.

Fifty to sixty percent of those who leave say they are going into industry. Some have a job already lined up. Ten percent declare they are quitting for "family reasons," and the rest say they are going back to school.

All the evidence indicates these factors are pulling airmen back into civilian life just as they become most valuable to SAC:

- Competition from industry.
- The GI education bill.
- Housing shortages at most bases.
- Periodic movement of servicemen, interfering with family life.
- General dislike of military service.
- The generally low esteem and prestige accorded an enlisted career by the American public.

SAC has a broad plan of action designed to cope with the problem. Some proposals require congressional or top Pentagon action.

One phase calls for less complicated, easier to maintain equipment. "We can get geniuses to design them but can't have an Air Force of geniuses to service them," said a SAC officer.

Another proposal is to let the Air Force raise its recruiting standards. Department of Defense regulations now force it to take a proportionate share of lower IQ men. SAC says many of the men it receives are "untrainable."

Other recommendations are aimed at making life in SAC more attractive. Last year's pay raise and increase in reenlistment allowance helped, boosting the SAC reenlistment rate from twenty-six to thirty-five percent.

But the trouble is that the percentage varies widely in various specialties. Sixty percent of SAC cooks are signing up for another term when their enlistments expire, while only ten percent of the Command's skilled radarmen are reenlisting!

"By civilian standards we are overpaying some people and underpaying others," said a SAC personnel officer. "Surveys show that the wage scale for cooks on the outside is $1.80 an hour or less, while an electronics supervisor gets $2.60 per hour.

"But the top pay of an Air Force cook and an Air Force electronics supervisor, both master sergeants, is the same—$2.35 an hour based on a forty-hour week. We have 239 job specialties and only seven pay grades."

The plan, not yet in final form, would apply to officers as well as airmen. Personnel officers stressed that SAC aircraft commanders make only $500 to $700 a month, while a commercial airline pilot makes from $15,000 to $20,000 a year—more than SAC's top generals.

Other proposals urged to improve career attractiveness include:

- More family and military housing.
- Medical care for all dependents.
- Expansion of commissaries and BXs, and cancellation of the present restrictions on the goods they can carry and prices charged.
- Amendment of the GI educational act, so that men who remain in service can go to school in off-duty hours at government expense.
- Correction of a present situation that is causing much bitterness among many airmen. Officers receive a subsistence allowance on a monthly basis, enlisted men on a daily basis. When individuals or units leave their permanent base on temporary duty at schools or other stations—and this is frequent in SAC—the airmen lose their allowance and the officers don't.
- Additional allowance to ease rough spots, such as extension of quarters allowances for airmen with dependents, per diem payments while on maneuvers, and raising rental and subsistence allowances in high-cost-of-living areas.

Much has been done during recent years to make life more attractive to servicemen and to boost reenlistment rates. Congress has raised pay and allowances. The Defense Department and Air Force Headquarters have taken other action. General LeMay has established hobby shops, designed new and more livable barracks, set up SAC flying clubs and dependents' assistance programs, and taken many other morale-building moves.

All these things help. But SAC needs assistance to solve its critical manpower problem. It must have sympathetic and prompt attention to its proposals by top-level Pentagon officials and Congress. And public understanding and support.

For too much rides on SAC's combat readiness in the world today to let correctible weaknesses continue. Survival is everyone's business.—END

The author, John G. Norris, is a staff reporter for the Washington, D.C., Post & Times Herald. *The above material, which has been adapted by the author for this magazine, appeared originally as a four-part series in Mr. Norris's paper March 11-14. Our use of the material is with special permission of the paper.—The Editors.*

SAC *bombers*

The Bomber's Role in Diplomacy

By Maj. Gen. James C. Selser, Jr.
DEPUTY COMMANDER, EIGHTH AIR FORCE, SAC

THE Strategic Air Command's role as a deterrent to aggression is so well established today that it is easy to forget that the interrelationship of airpower and diplomacy is a relatively new concept. SAC bombers first became an instrument of international diplomacy when six Boeing B-29s of the 43d Bombardment Group, Eighth Air Force, flew a secret mission to the American Zone of Germany in November 1946.

For centuries naval forces had been considered as the primary military arm of our foreign policy. One of the first, and certainly the most colorful, illustrations of the use of a military force as an instrument of diplomacy occurred when President Theodore Roosevelt sent a fleet of sixteen battleships on a cruise around the world. Although the maneuver was termed a "practice cruise," it was generally associated with the administration's Japanese policy. Roosevelt later concluded that sending the fleet around the world "was the most important service that I rendered to peace. . . ." The Navy became Roosevelt's "Big Stick."

However, the atomic age ushered in a new era in international diplomacy through airpower. The then-exclusive ability of SAC to deliver atomic attacks of the Hiroshima-Nagasaki variety placed it in a position to challenge the Navy's traditional role as the strong arm of the State Department. When two American C-47s were shot down over Yugoslavia in August 1946, the Army Air Forces through the Assistant Secretary of War for Air, W. Stuart Symington, sought approval for an around-the-world flight of B-29s as a demonstration of American airpower. Secretary Symington wanted his planes "to be recognized as an instrument of international policy-making." This project was disapproved by the State Department, but a flight of six B-29s to Germany was approved. As commander of the 43d Bomb Group, I had the good fortune to lead the Superforts to Europe.

On November 8, 1946, only five days before X-Day, the 43d Bombardment Group was alerted to prepare for a special mission to an unknown destination. Eight B-29s, including two spares, and two Douglas C-54 Skymasters were to be prepared for the mission. The instructions required that the B-29s carry enough equipment and spare parts to operate independently for thirty days.

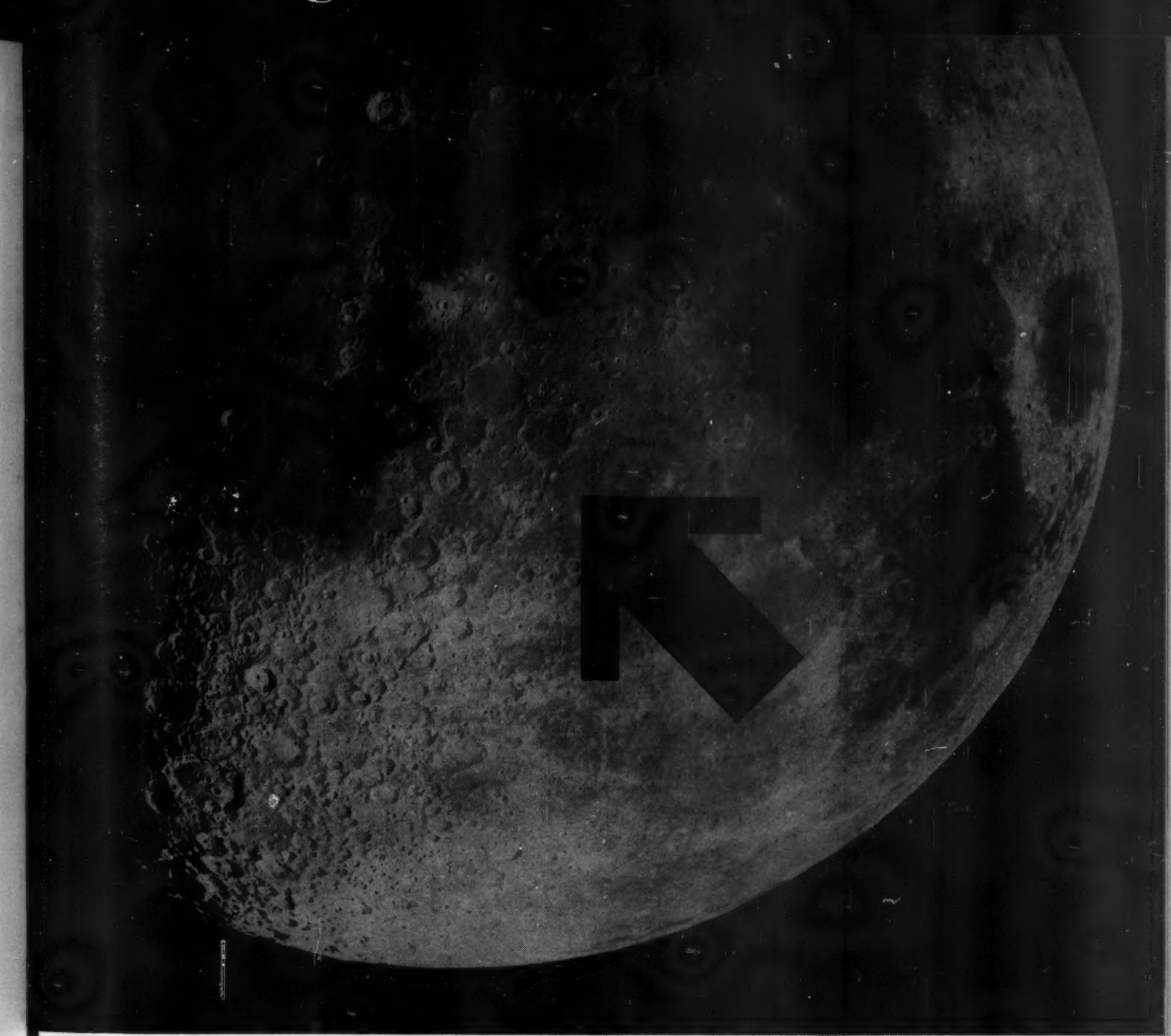
Requisitioning the necessary supplies proved to be the major problem. The B-29s were of the latest series and had fuel shut-off valves unlike any of their predecessors. Neither the aircraft nor the special valves were being manufactured at that time, and as a result, we had to cannibalize other aircraft of the same type at Davis-Monthan Field, Ariz. In addition, the propeller governors were being modified at Oklahoma City Air Depot, and only eight governors were ready in time for the mission.

Our first destination, Morrison Field, West Palm Beach, Fla., was not disclosed to all members of the flight until the general briefing was held—only four hours before take-off. Even then rigid security restrictions limited the briefing. However, the role of the combat crews as a "show team" was stressed.

At two o'clock on November 13, 1946, seven of our B-29s left Davis-Monthan at one-minute intervals. One

(Continued on page 55)

Boeing B-29 Superfort. SAC bombers first became an instrument of international diplomacy when six B-29s of the 43d Bombardment Group, Eighth AF, flew to Germany in November 1946 after two US C-47s were shot down over Yugoslavia.



NEW FRONTIER

"If we had to put a man on the moon, we could do it."
—Overheard at an Institute of Aeronautical Sciences luncheon

This impromptu statement was not a matter of idle conjecture. It was a statement of a positive and scientific fact – as provable as if he'd said the Aleutian Islands—and contingent only upon three prime requisites: enough time, money, and necessity. And by "we" he meant today's mindpower and facilities operating under the most advanced concepts of research and development.

Those concepts as practiced at Martin today would be essential to the fastest possible solution of any complex flight systems problem now within the capacity of man to solve.

It is this that has established Martin as one of the prime forces in the coming conquest of the new frontier—Space itself.

MARTIN
BALTIMORE

Cessna T-37 designed for Jet Training

To meet jet age demands, the U. S. Air Force requires a jet trainer that makes it easy for cadet-pilots to master first line combat airplanes.

The Cessna developed T-37 introduces the cadet to all combat jet airplane characteristics while training on this safe, easy-to-fly jet trainer.

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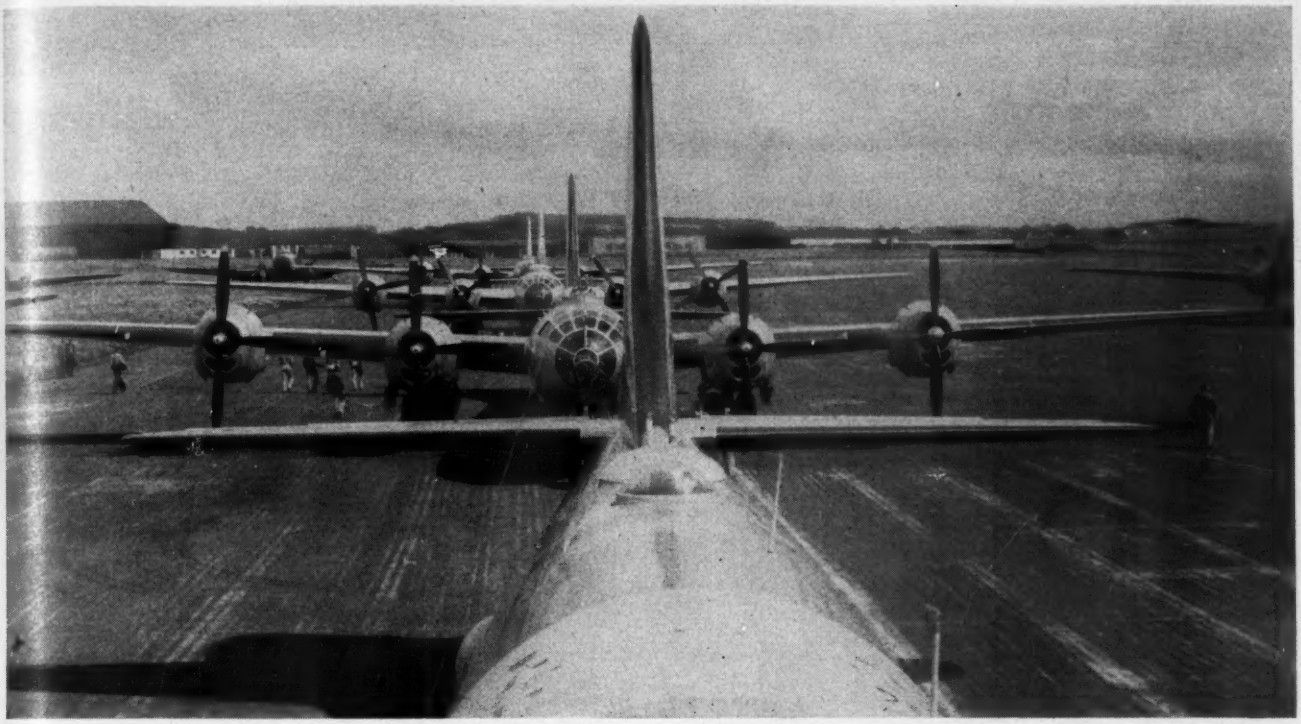

B-29s of the 43d Bomb Group in Germany, 1946. This token force represented the world's only atomic striking power.

take-off was delayed an hour and thirty minutes when a prop governor needed changing. Average time for the flight to Morrison Field was seven hours and three minutes. The complete flight was made at 15,000 feet, and the weather on this first leg of the mission was excellent.

On arrival at Morrison Field, I was told by Strategic Air Command Headquarters that the flight across the Atlantic was to be so scheduled that not more than two B-29s would be at Lagens Field (now Lajes Air Base), Azores, at any one time. As a result we had to devise a system whereby each group of two aircraft arriving at Lagens would relay its departure plans to Morrison Field so that the succeeding group could plan its flight accordingly. A failure of communications between Morrison Field and Lagens resulted in considerable delay in scheduling succeeding groups. The two spare B-29s were directed to stand by at Morrison until we had arrived at our ultimate destination—Frankfurt, Germany.

Inadequate communications also made weather forecasting over the Atlantic extremely uncertain. In addition, all forecasts in the Azores were at least six hours old and accurate weather information beyond Orly Field, Paris, France, was not available.

After we left the Azores, all designated alternate airfields in Europe and North Africa were reported to be below established weather minimums. Thus, we were forced to land at our planned destination, Rhein-Main Airfield, Frankfurt, Germany, even though the ceiling of 200 feet and half-mile visibility presented serious problems. Approach control and tower personnel at Rhein-Main, who were not familiar with the approach speeds and landing patterns for B-29s, further complicated the situation. Therefore, we had to assist them in directing all subsequent approaches and landings.

On arrival in Frankfurt, the Superforts were quickly prepared for possible immediate combat. Operational missions conducted in Europe were carefully planned and briefed. These included flights along the borders of Soviet-occupied territory, display of the aircraft and crews at

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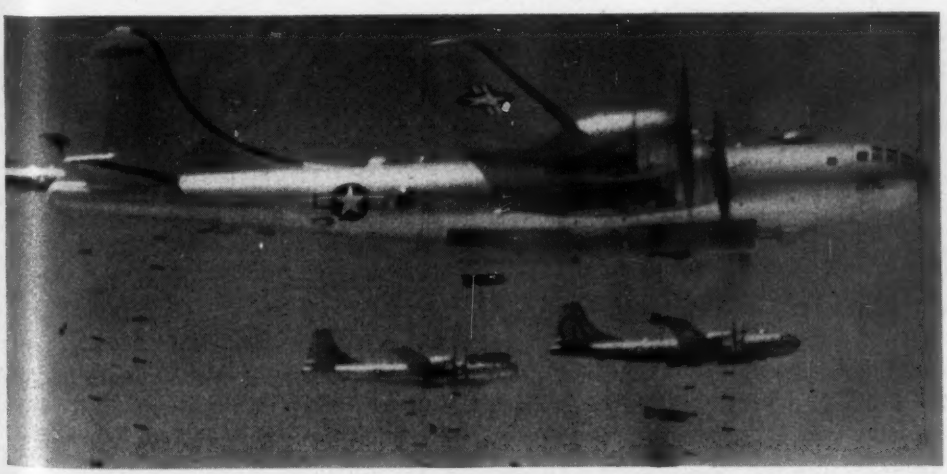

The primary role of a bomber—as typified by these B-29s over North Korea—is well-known. Another important role is the relatively new use of bombers in diplomacy, as a military arm of our foreign policy.

the capitals of free European countries, and surveys of suitable airdromes for compilation of data to be used by succeeding SAC organizations.

After approximately twelve days in Europe, we departed on November 29 and returned to Davis-Monthan.

To properly evaluate the diplomatic import of this mission, one must remember that this token force represented the only atomic striking power in the world. The international situation at that time was particularly tense, and the base of western allied power had not yet been laid. The spirit of allied cooperation had not yet been supplanted by a realistic appraisal of Russia's imperialistic goals; Soviet domination of all Eastern Europe was not yet an accomplished fact; and the effects of almost complete demobilization in the US were still apparent.

The intractable attitude of the Soviet representatives at high-level conferences in 1946 had increased international tension. Relations already strained were stretched almost to the breaking point when two Army Air Transport Service C-47 aircraft were shot down over Yugoslavia in August 1946. The second of these incidents resulted in the death of five Americans.

The feeling was widespread in America that Russia and her satellites were taking advantage of US military weakness.

In view of then-existing world conditions, our unprecedented flight of even a small group of B-29s to Europe was a significant event. Although the flight itself could not have been interpreted as a threat to Russia, the implications were obvious to thoughtful observers. Our B-29 was widely recognized as the aircraft capable of delivering the atomic bomb. Furthermore, the appearance of B-29s in Europe was certain to cause speculation about the possibility of stationing the Superfortresses there permanently.

Although not publicized at that time, we conducted a survey of European airfields to determine which might be suited to B-29 operations. It seems probable that the Soviet Union anticipated the complete withdrawal of US forces from Western Europe, leaving a vacuum which the Soviets hoped to fill. This flight could be regarded as symbolic of the growing sentiment in the United States against creating such a vacuum.

It is a matter of record that Mr. Molotov adopted a more amenable attitude during the course of the meetings of the Council of Foreign Ministers, held in New York City in November 1946.

This mission firmly convinced us that SAC units should deploy periodically to overseas bases for tactical training. This practice soon became an integral part of SAC's training program. Entire wings of B-36s and B-47s, present-day workhorses of the Strategic Air Command, now rotate periodically to overseas bases for intensified operations under simulated wartime conditions. Capable of delivering any air weapons in the nuclear arsenal, the aircraft, their crews, support personnel and equipment are maintained in a constant state of readiness. Along with new developments in aircraft and weapons have come refinements in operational techniques, crew training, maintenance and supply. SAC bombers deploy in a matter of hours with sufficient spare parts and supplies to operate under sustained wartime conditions for at least thirty days. SAC's global capability has certainly been a major factor in the formulation of American foreign policy.—END

Boeing B-50, a faster version of the Superfort, helped to bridge the gap between the B-29s and SAC's jet bombers.

MAJ. GEN. J. C. SELSER, JR.

Born in Alexandria, La., in 1912, General Selser was graduated from Georgia Tech with a B.S. degree in aeronautical engineering in 1933. That year he entered cadet training, receiving his regular commission in 1936. In 1940 he became a member of the US air mission to Brazil, and was appointed Military Air Attaché to Brazil in 1943. After attending Command & General Staff School and the Army-Navy Staff College, he served on Okinawa as Tenth Army G-2 for Air, later commanded a Tinian-based B-29 group. He led the first flight of B-29s to Europe in 1946, and was commander of Davis-Monthan AFB until 1950 when he became SAC's Deputy Director of Operations. He commanded SAC's 7th Air Division in England before taking his present assignment as Eighth Air Force Deputy Commander in September '54.

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Young Men! Your Future Begins Now... in the U.S. AIR FORCE

How SAC Tackles Its Security Problem

By Brig. Gen. David Wade
INSPECTOR GENERAL, SAC

IT WAS still raining when the bus stopped at the corner. A man got off and ran for the shelter of the drugstore doorway. Across the street a young kid was unlocking the pumps at a filling station. Next door the windows of a cafe were a yellow glow in the early morning darkness.

The man shoved a newspaper-wrapped package under his raincoat to keep it dry and ran across the street to the cafe. It was warm inside and there were smells of hot coffee, ham and eggs. He stamped water from his shoes and moved toward a booth at the end of the room.

They were waiting for him. "Mike the Wrench" and Jack. Mike grinned, "Look at the white overalls. You a painter looking for a job?"

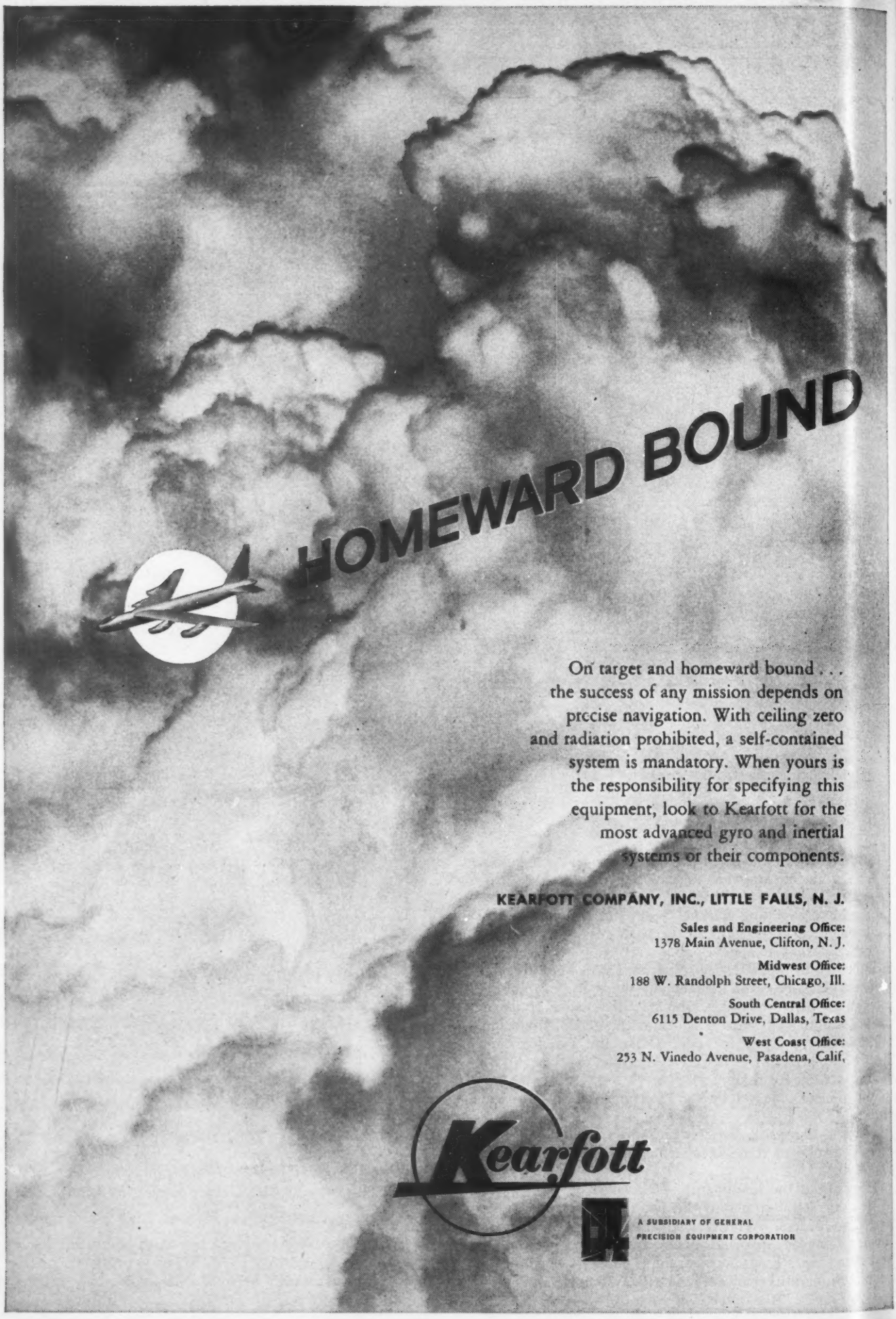
"What else?" He sat down. "You guys all set? Anyone suspicious?"

"Naw," Mike said, "we're old hands, Neal. I'll have a wrench on one of those bombers before they know we're around."

"How about the lieutenant?" Jack asked.

"He's all set. Reports to the wing this afternoon with bona fide orders. Almost bona fide, anyway. Sergeant Thomas reported in to headquarters squadron last night." Neal stood up. "Everybody straight? Okay, see you guys around. Be careful, move slow and stay out of jail."

(Continued on page 61)



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It was light outside and the rain had stopped when Neal left the cafe. He carried his raincoat over one arm, the package half hidden under it.

Neal watched the other painters carefully. So far so good. He was on the base, temporarily hired to help with a rush paint job in the communications building. He wondered if they had noticed he was a little clumsy with the brush. Probably don't care, he thought. It's just another eight hours to them, and I'm a temporary flunky helping out. He glanced at his watch—nearly noon.

It was 12:30 when the alert sirens cut loose. The painters had gone to lunch and Neal was alone in the new wing of the building. Through a window he could see men running. From within the comm center he heard steel bang on steel as safes were closed and locked. He grinned. What a lousy time for the base to go on alert. Chow time. Meals half-finished. Skeleton forces on duty. Everyone out of position and off guard.

He walked quickly through the passageway joining the wing to the main building. Only a few people were around during the noon hour. "What's up, Sarge?" he asked the first man he saw.

"It's a sabotage alert. Condition Red." A/3C Rawlings was important with his knowledge. "They caught a guy monkeying with a plane down the line. Guess there's a penetration team on base."

"What do we do? I mean, can I keep on working?"

"Well. . . ."

"I'm supposed to check equipment for scaling paint and rust. Okay if I go ahead?"

"Yeah, guess so. Sergeant Ramsey isn't here now, but he'll be back in a few minutes. You been here all morning. We're supposed to check everybody, you know, in an alert, but you been here, so sure go ahead."

"Thanks." Neal moved away quickly. He wouldn't be there when Sergeant Ramsey came back.

The provost marshal wasted no words into the phone. "Hello, Fox One? Got two guys here. A/1C Michael J. Rodski, AF 15677231, and M/Sgt. Neal B. Turnbull, AF 35972843. Know 'em?"

He listened a moment, let out what passed for an affirmative grunt, and turned to Mike and Neal. "Okay. Your command post identifies you as legitimate penetration team members. You're free to go." He looked at Mike. "I've heard of you, Rodski. You say you can lay a wrench on any SAC plane, huh? We nailed you quick enough, didn't we?"

"That crew chief was tough, Major. Didn't buy my story, and when I tried to get away, that sonuvagun *tackled* me, right on the concrete. Skinned my knees and tore my coveralls."

The major glared at Neal. "Didn't you do enough damage in the comm center? Were you going to try to blow up the whole base? You had enough simulated explosive devices in that package to do it."

"No, just the ammo area if I could get in. How'd you get me so quick after I left the center?"

"Sergeant Ramsey got there in time to see you leave and when the kid told him you'd poked around through the building he called us and then Installations to check you. You checked out phony. Ramsey and my boys found your three devices in time, we figure, to disarm them, but Ramsey was still mad about you getting loose in there. Understand he threatened the kid with night duty for the rest of his life."

The major reached for his cap. He felt pretty good. Two penetrators caught, two more to go, and his boys were closing in on one right now. A mysterious lieutenant had been spotted in wing ops. "One of my cars will give you a lift into town." He smiled for the first time, "Catch you guys on my base again and I'll put you under the guardhouse."

In room 305 in the Hotel Royal downtown Neal sat by a telephone. He was now in charge of the team's command post, Fox One, and he or Mike would have to stay by the phone until the rest of the team were caught.

Eight months before, M/Sgt. Neal Turnbull had little interest in penetration teams, except for the trouble they caused when they got on his base in Texas. Then every man on the base became a policeman-in-fact, suspicious of every stranger, watchful for the slightest thing out of order. When a penetration team was on the loose, base security was everybody's business.

Now he was winding up his last job as a penetrator. He had "visited" nearly a dozen Strategic Air Command bases, including two overseas, punching as many holes as he could in SAC's security defenses. He'd be glad to get back to regular duty.

Back in 1949, when Neal Turnbull was a MATS flight

(Continued on following page)

An Air Policeman guards a B-47. Wartime security in peacetime is a new idea, but one in which SAC strongly believes.

engineer, flying out of Washington, the Strategic Air Command was only three years old. Even then it was beginning to worry about the security of its combat forces.

Before 1949 the SAC air policeman worked at time-honored provost functions, gave little if any concern to the protection of the combat force. But, as international pressures built up, the security problem grew.

The policing concept began to cover protection of the whole land area of each SAC base, patrolling the entire perimeter, and stationing point guards at each aircraft. SAC needed 7,800 men to do the job, and $2.7 million worth of fences, towers, lights, and patrol roads.

The program grew slowly until the Korean war in 1950. Enlistees and experienced reserves were suddenly made available—and Sergeant Turnbull was transferred to a B-29 outfit in the Far East.

A security officer recruiting program got under way in 1951 and at Fort Carson, Colo., young airmen were trained in the rudiments of security and air base defense in a new SAC Security School.

A security intelligence program, giving SAC commanders subversive intelligence, was begun to aid in developing local security plans and to indicate the over-all subversive problem. A basic manual, kept current through quarterly supplements, furnished information relative to the world-wide security situation.

In mid-1953 the vulnerability testing program began. This idea, which later turned Sergeant Turnbull into a skilled "enemy" agent, became one of the greatest single factors in strengthening SAC security. Tests conducted by the Office of Special Investigations and by teams of carefully picked SAC men began measuring the adequacy of the Command's developing security program. Tests were aimed at showing how bad, not how good, the internal defenses were. Combat organizations on the bases were rated and their scores compared.

The penetration teams hit hard, using every means available to throw base defenses off guard. They forged orders and passes, climbed over and under fences, stole base vehicles, posed as milkmen and Coca-Cola salesmen, as air policemen on duty and aircraft company tech reps —anything and any way to get on base and get to a sensitive area to simulate attempted sabotage.

At one western base a pick-up truck drove slowly across the flight line after the base alert had sounded. In the middle of a long line of aircraft the truck sputtered to a stop. The driver poked around under the hood a few minutes, then asked a nearby crew chief where the nearest phone was. For an hour and a half the truck, theoretically loaded with explosives, stood unmolested among millions of dollars' worth of airplanes.

On another base a team member posed as a security courier. He walked into base communications, said he was grounded for several hours due to engine trouble, and would the sergeant be so kind as to put his briefcase of "classified" documents in the vault for safekeeping? The briefcase, the vault and the sergeant were, theoretically, scattered all over the landscape a few hours later.

Here's another gimmick used successfully at several bases. An officer and a civilian represent themselves as technicians from Air Materiel Command—probably with a faked operational TWX (teletype message). Once on the line they sabotage every aircraft they can. At each they leave a ten-inch roll of white paper, symbols of explosive devices an enemy agent might plant.

Another test team posed as a surveying party and surveyed its way across the outer fence, the runways and eventually found its way into the aircraft parking ramp.

Central Security Control sections serve as Air Police headquarters on SAC bases, are open both day and night.

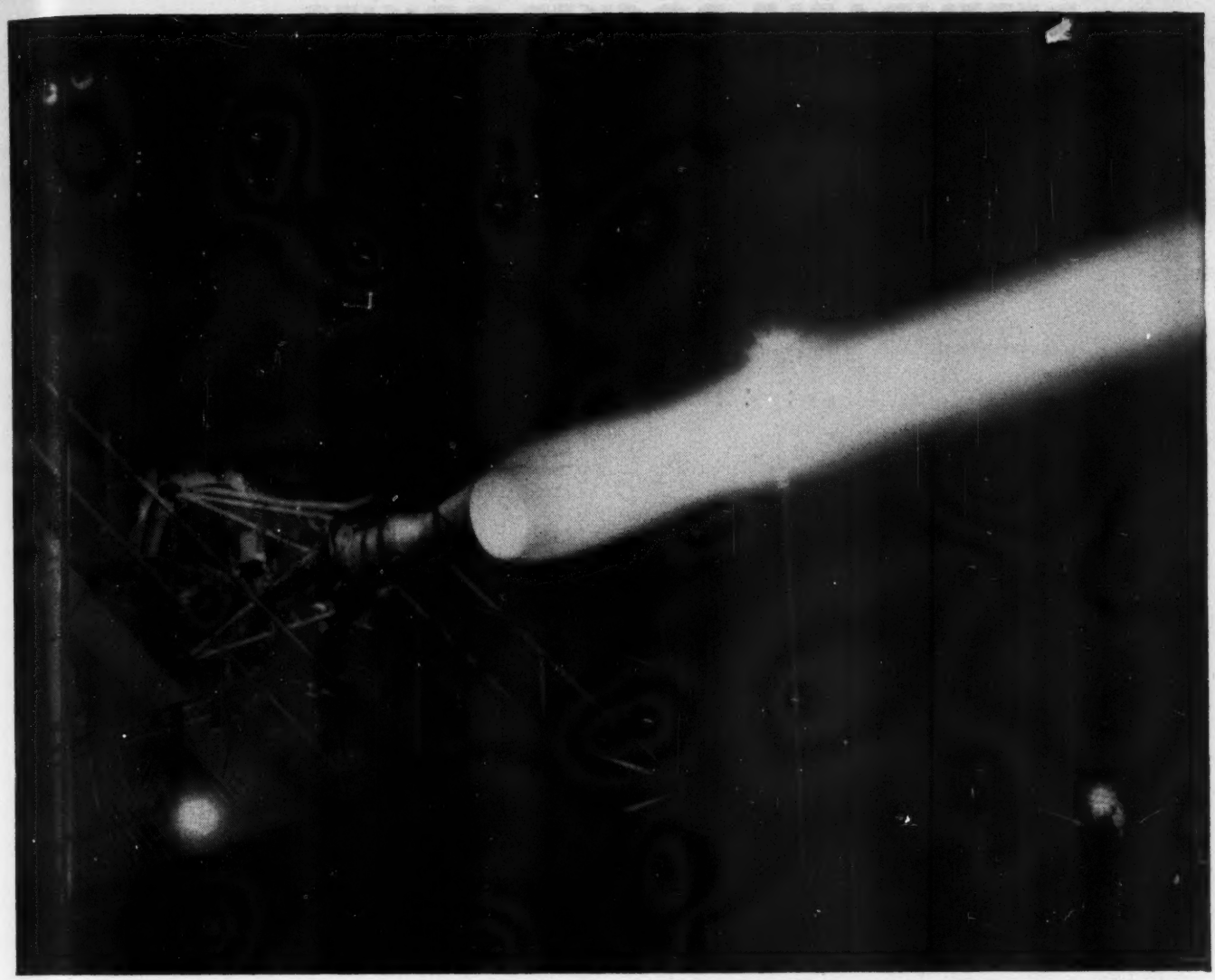
But it is harder going now to fool SAC men. At Bergstrom AFB, Tex., four agents approached a flight line gate. Three were admitted but the air policeman on duty stopped the fourth for further check. He looked too old for an airman first class. All four were caught.

Sometimes a team will make a bad mistake. At Lake Charles AFB, La., a member of a penetration team from Lockbourne AFB, Ohio, discovered that the only apparent difference between flight line passes was the base name. The team mutilated their Lockbourne passes to look like Lake Charles. One by one they attempted to enter the flight line area. Each was promptly arrested. The Lockbourne pass was pink, the Lake Charles pass, gray. The reconnoitering team member was color blind.

One moonlight night at Carswell AFB, Tex., a test team leader tried to get on the base by swimming across bordering Lake Worth. As he neared the dark shoreline, a shot and a ricocheting rifle bullet changed his mind and he made the trip back in near record time.

(Continued on page 65)

A four-footed member of the SAC Air Police team leaves no doubt about what he would do on spotting an intruder.



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Engineers studied available fuels so that engine designs could extract maximum energy from every gallon. This called for new pumps . . . and turbines to drive them. Turbines, more powerful than 10 auto engines yet smaller than a car battery, were built. The completed engines, tested at ROCKETDYNE'S propulsion field laboratory in the nearby Santa Susana Mountains, have passed the rugged requirements of space flight.

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And at MacDill AFB, Fla., a "saboteur" spotted a sentry dog and his handler. He swarmed back over the fence so quickly he ripped his hand on the barbed wire. Actually he got away that night, but the APs figured he would have the hand treated at the base hospital. They nabbed him when he came in.

Two years of such attacks, as often as six times a year at each station, have brought about a noticeable improvement in individual base security systems. Every successful sabotage attempt has resulted in immediate steps to plug a loophole and alter the system.

In addition, an attack by a penetration team is part of every Unit Simulated Combat Mission carried out by a combat wing. These teams, usually one officer and four airmen, are hand-picked for their ingenuity and special abilities. They are thoroughly briefed on the installation and the community and are armed with rosters of key personnel. However, a team gets no information which could not be obtained by an enemy agent.

Fifteen days before a USCM, the team arrives in the area but confines its activities to espionage. Five days before the mission the team leader, per regulation, phones the base commander that his team is in position. He gives the base commander the code name and telephone number of the team's command post, which is manned as long as any team member is at large. This is to eliminate the possibility of an enemy agent posing as a team member.

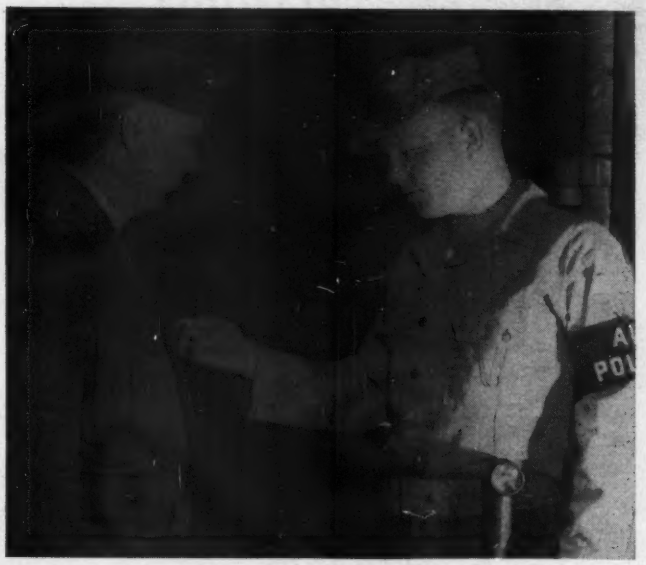
SAC plays this game in earnest. Air policemen, if negligent, can be reduced in grade. And no wing commander likes to explain why his organization's security has been penetrated.

In 1954 SAC faced another problem bearing directly on its security program. A personnel shortage was developing while the command was still building up. Career men like Sergeant Turnbull were staying in, but thousands of younger men pulled in for the Korean crisis were returning to civilian life.

As a result, SAC's original plan—to protect the entire land area of a base—had to be reduced to minimum patrol requirements. The bulk of security forces were drawn around combat aircraft and other essential supporting facilities. Seventy percent of the air police force was assigned exclusively to security functions.

Even this concentration of forces left much to be desired. Something else was needed to increase the effectiveness of the man on the guard post. Sentry dogs seemed to be the answer.

Tests conducted at Barksdale AFB, La., confirmed previous successful experiences with sentry dogs in overseas operations, and during 1955 the sentry dog began to appear on stateside SAC bases. Each trained dog more than doubled the effectiveness of his sentry-handler. By the end of 1955, 350 dogs were on duty. That number continues to grow, to the discomfort of SAC's penetration teams.



Checking a pass on the flight line. Short on personnel, SAC puts bulk of security forces around combat aircraft.

BRIG. GEN. DAVID WADE

Brig. Gen. David Wade became Inspector General of SAC on June 1, 1955. Born in Minden, La., on June 15, 1910, he entered the AF in 1935 as a cadet. He held various staff and command positions in World War II and in 1945 went to the South Pacific for twenty-six months with bomber groups there. In 1948 he became Deputy Commander of the USAF Security Service in Washington and during the Korean war he went to Japan where he served as Commander of the 98th Bombardment Wing. Before assuming his present position, he was Commander of the 21st Air Division, SAC, stationed at Forbes AFB, Kan.

The dogs give a tremendous psychological boost to the AP patrolling a lonely post, but their most valuable contribution is their keen sense of smell. Primary task of these teams is to detect an intruder and sound the alarm, and then to apprehend the trespasser.

Once the alarm is sounded, the security control center dispatches an alert force to the trouble spot. If there is evidence of a sabotage attempt, all squadrons are alerted to "Condition Red." Thousands of eyes suddenly become suspicious of every man. The general order for every officer and airman is seize, search, and secure.

Should an attack in force be indicated, the sabotage alert immediately becomes an air base defense activity, and a defense in depth is established around vital elements of the combat striking force. Meanwhile combat operations sections have readied the crews and aircraft for possible action.

This is the goal of Strategic Air Command's security system—a base kept secure and standing ready to perform its primary mission.

The maintenance of wartime security in a peacetime era is a new idea, but it is one in which SAC strongly believes. And SAC men learned long ago that the Command holds each of them responsible for its security.

M/Sgt. Neal B. Turnbull, penetrator, learned this the hard way. In a small town near a southern base he found a tech sergeant one night propped on a bar stool and happily downing his bourbon and branch. It looked like easy information and Turnbull, neatly dressed in a flannel suit, struck up conversation, bought the sergeant a drink, and tactfully guided the talk into more informative channels. In his report of the incident Turnbull stated that finally the sergeant stood up and said, "Buddy, you've asked just one question too many about *MY* base and business and I'm going to punch you in the nose!" Turnbull's report concludes, ". . . which he proceeded to do!"—END

SAC *Weather*

The World's Weather... How SAC Finds Out About It

By Col. Frederick J. Cole
COMMANDER, FIRST WEATHER GROUP

THE AGE of weather forecasting began when man first appeared on earth. He found a world already shaped by weather—blackened by fire, frozen by giant ice flows, eroded by rain and flood. Lightning flashed above, powerful storms swept across the earth, and there were long periods of alternating heat and cold. Man was quick to understand that weather was an ever-present force that he had to reckon with in his daily life.

But until the age of flight, man was not greatly concerned with predicting weather's vagaries. His was a local problem of rain, snow, or sunshine. His only interest in a storm several hundred miles away was how much that storm might later affect his own locality.

Then came the airplane.

In fifty-odd years aviation has developed at such a fantastic rate that today Air Force weathermen working in support of the Strategic Air Command are charged with forecasting world-wide weather. The jet aircraft of SAC, flying at 600 mph eight to ten miles above the earth, span oceans and continents in a matter of hours in routine operations. Obviously this type of flying involves extensive weather support.

Since 1951 the 1st Weather Group has been assigned the task of furnishing weather support to SAC's global operations. Before then weather forecasting had been done on a regional basis, and the primary job of a forecasting center was to provide weather data about its particular area of responsibility. When the Air Weather Service was reorganized under MATS in 1951, a functional concept of forecasting was adopted. This meant that a specific weather unit—the 1st Weather Group in the case of SAC—was charged with supporting *all* operations of a specific function. Detachments from the 1st Weather Group were assigned to SAC bases in the US and overseas. Similar groups were assigned to support the other Air Force commands. From SAC's point of view, the changeover was a great improvement, for it allowed specialized support for SAC's specialized purposes.

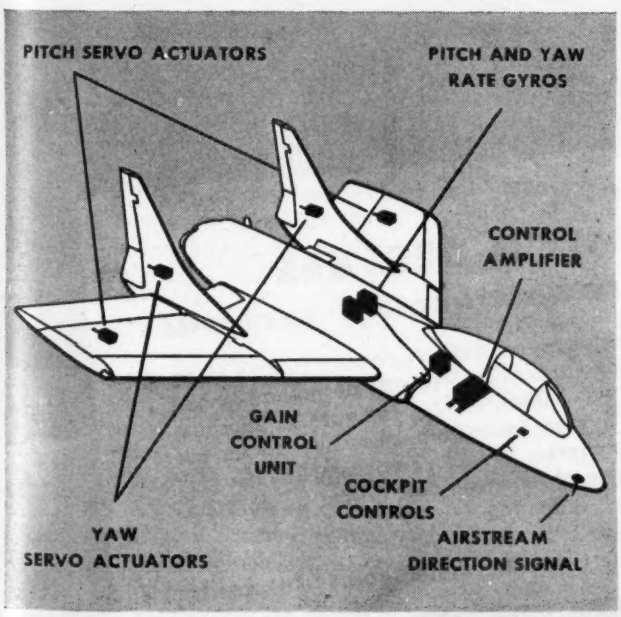
The requirements of the Strategic Air Command present the most interesting and challenging assignment any weatherman ever had. Sixteen percent of SAC's aircraft are in the air day and night the year around. They fly long hours and many miles over flight paths of infinite variety. Every three and a half minutes around the clock one of these jet bombers meets a tanker plane for a refueling rendezvous, as often over

(Continued on page 69)

SAC's meteorologists snoop out the world's weather for its bombers.

CHANCE VOUGHT F7U-3 equipped with G-E flight stabilization system catapulted from carrier. (Official Photograph U.S. Navy)

How G-E flight stabilization system makes the Cutlass a stable gun platform



G-E FLIGHT STABILIZATION SYSTEM on the Chance Vought F7U-3 Cutlass damps yaw and pitch oscillations.

By damping the yaw and pitch oscillations caused by rough air, a General Electric flight stabilization system makes the Chance Vought F7U-3 a stable gun platform. This stabilization system automatically moves the control surfaces to (1) correct for yaw oscillations, (2) correct for pitch oscillations, and (3) correct for slips and skids. The fine performance of the Navy's Cutlass is further enhanced by this added flight stability.

General Electric has had extensive experience in designing and manufacturing many types of flight control systems and tieing them in to bombing, approach, and fire control systems. This experience is being put to use in building flight control systems for the latest supersonic aircraft.

FOR INFORMATION on G-E flight control systems, contact your General Electric Aviation and Defense Industries Sales Office. Section 221-7, Schenectady 5, New York.

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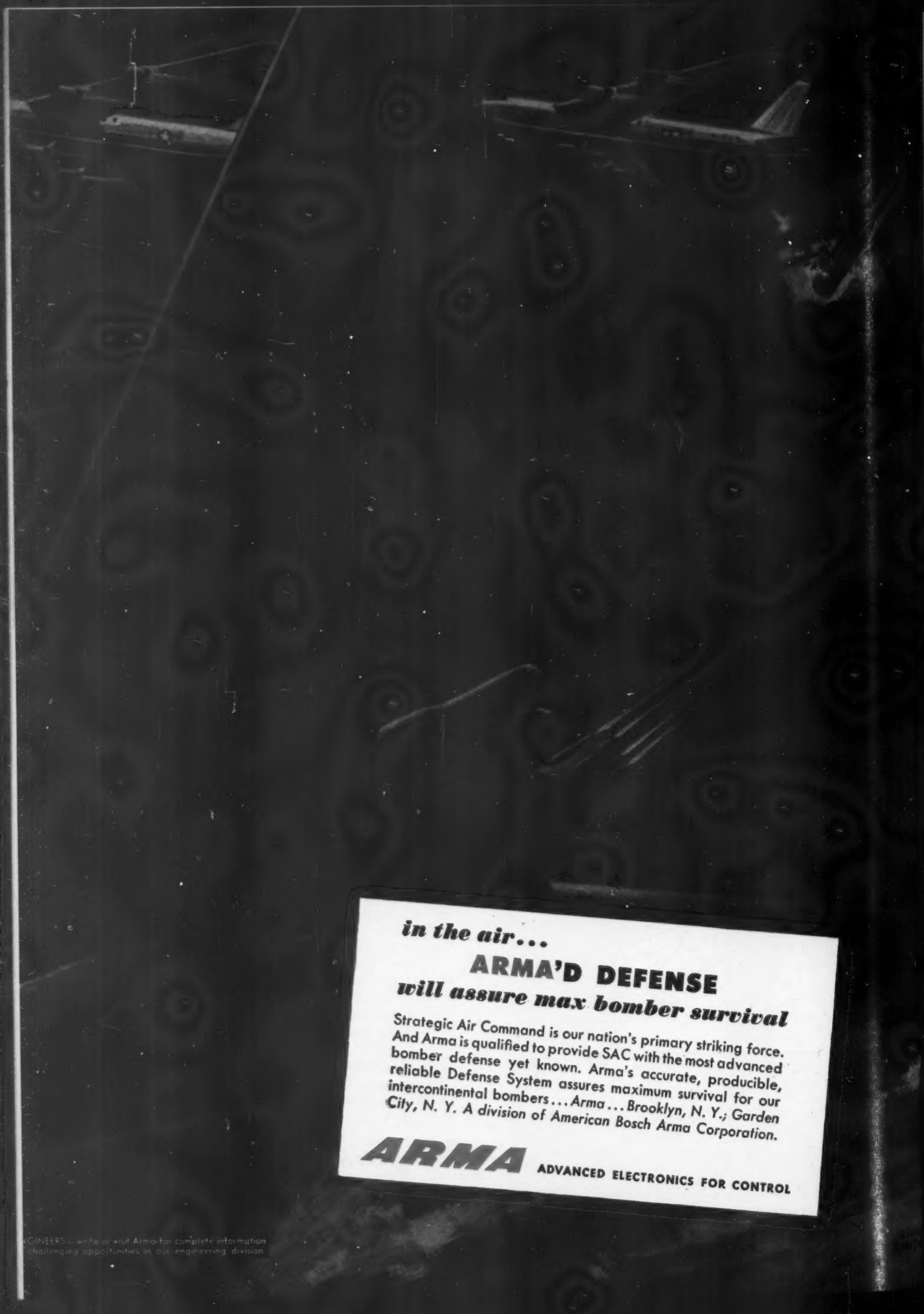

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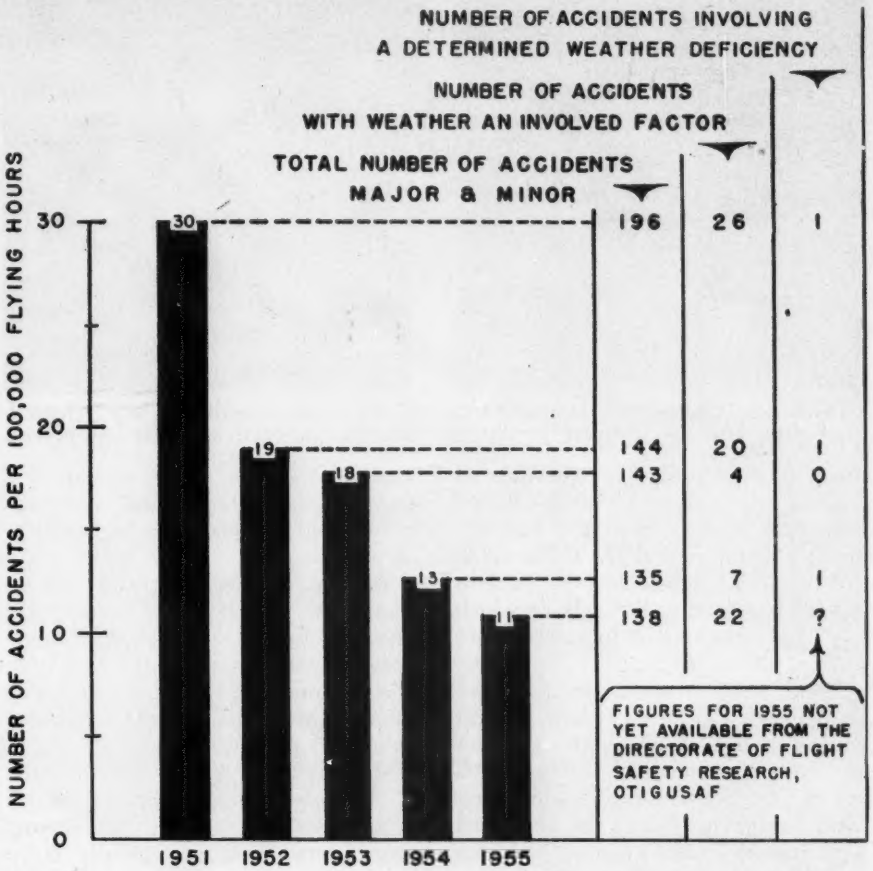
the trackless waste of an ocean as over land. Wherever they go, on this or the far side of the world, the SAC planes and crews must have accurate and detailed information about the weather along their flight paths. Since a mission may be ordered to any place, at any time, weather information must be immediately available when needed.

In order to meet these stringent requirements, weather personnel have to work closely with operational units, providing weather support at the level at which missions are planned and carried out. As a result, about seventy-five percent of all missions flown by a wing are directly supported by the base weather station. There is a close tie-in between the operations section of the bomb wing and the station, and the weather detachment commander and the wing weather officers are key people. When a wing deploys overseas for short periods of temporary duty or for ninety-day rotations, wing weather officers go along and, through overseas facilities, provide the essential weather service. This arrangement assures a continuity of reliable weather support at home base as well as overseas.

Contrary to the popular belief, the weatherman's job is not over when the air crews take off on a mission. As the mission goes on (many last more than twenty-four hours) the weather is carefully watched for any changes that might affect the safety of flight. Under marginal conditions, when certain bases might be closed in by bad weather before the mission ends, the weather at all possible alternate bases is constantly checked by operations and weather personnel. This information is checked against a "how-goes-it" analysis of the mission in progress and how much fuel is left in case an alternate base must be used. If a change in weather dictates a change in mission plans, the information is already at hand to eliminate weather hazards.



A weather analysis of SAC's accident rate (1951-1955) shows that only a small number of accidents have involved erroneous weather information.

A weather analysis of SAC's aircraft accident rate during the past five years (*see chart*) shows that while the total number of accidents has continued downward during the period, the number of accidents involving weather has followed an erratic pattern. For the most part, however, this erratic behavior reflects flight limitations of aircraft. For example, an accident resulted when an F-84F lost power while in a cloud because the super-cooled water in the atmosphere had a contracting affect on the rotating shroud of the jet turbine. To weathermen the most significant figures in this chart are the "Number of Accidents Involving a Determined Weather Deficiency." The man who decides whether or not to charge an accident against a weather deficiency is the Director of Flight Safety Research at Norton AFB, Calif. Any such deficiency must be corrected or eliminated immediately.

As control of an operation moves upward, so does responsibility for weather support. When more than one wing or division is involved in the planning and execution of an operation, direct control generally is exercised by one of SAC's three numbered air forces. If more than one air force is involved, SAC headquarters generally assumes direct control.

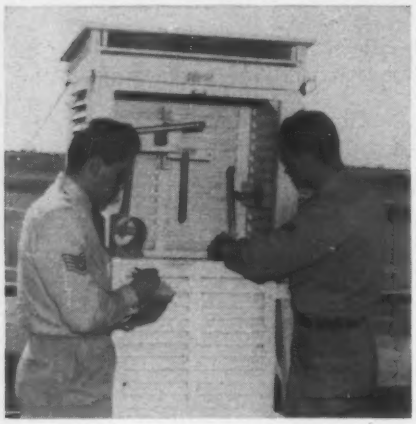
In a like manner responsibility for weather support is changed from a base weather station to a forecast center at a numbered air force and, finally, to the Offutt Weather Central at SAC headquarters. Forecast centers have a partial hemispheric capability, while the Offutt Central's forecast capability covers the entire hemisphere.

With its hemispheric capability, Offutt Weather Central carries as high as twenty-five percent of the weather support load of each base by making the forecast for any mission or any part of a mission beyond the capability of the base weather sta-

(Continued on following page)

COL. FREDERICK J. COLE

Colonel Cole was born in Springfield, Mass., and is a graduate of the University of Massachusets. He later did graduate work in meteorology at MIT and entered the military service as a meteorologist in 1940. In WW II he served two years in the ETO, the last year as weather officer for the Fifteenth Air Force in Italy. Colonel Cole has been with the Strategic Air Command since 1951 and is now commander of the First Weather Group, stationed at Offutt AFB, Nebr.



Weathermen take periodic temperature, humidity, and air pressure readings.

After weather balloons are released, they are tracked by radar equipment.

Forecaster answers a phone request about wind velocity and jet streams.

tions. The chart showing the forecast load of the Offutt Weather Central shows an increase from 450 forecasts in a six-month period in 1952 to 1,450 forecasts during the last six months of 1955, reflecting the rate at which SAC operations have increased since 1952.

The weatherman's basic tools—maps and charts recording current national and hemispheric weather data—are supplied daily to SAC weather stations by the facsimile network originating at the National Weather Analysis Center at Suitland, Md. The center and its network support nearly all military and civilian weather organizations in the US. Reception of the basic charts from a central source allows SAC weathermen to concentrate their efforts on the specialized charts and forecasts required by their chief customers—the combat crews and the men who plan their missions.

Forecasting for flights from stateside bases to North Africa, England, Greenland, Alaska, or Pacific bases is routine for SAC stations. The major problem in this kind of forecasting is much the same as it always has been: lack of sufficient weather data because there just are not enough weather stations in the empty expanses of the oceans. In addition, since the planes on many of these missions may be hours apart, SAC weathermen and combat crews have developed a technique whereby en-route weather data accumulated by one flight is quickly appraised and included in forecasts for following flights. The professional ability of SAC crews to translate the weather they meet into accurate in-flight reports increases the accuracy of subsequent forecasts.

However, these in-flight reports are often not as detailed as weathermen would like, and there are hopes that sometime in the future aircraft will carry lightweight, digital recorders which will automatically log en-route data.

Studies of the jet stream and its effects on aircraft operations in 1954 showed the value of such airborne weather observing platforms. With the cooperation of Pan American World Airways and Mr. S. Serebreny, Pan AM's technical supervisor of meteorology, two specially instrumented B-36s were flown from Japan to Maine along the course of the jet stream. One aircraft was intentionally flown in the jet stream while the other followed a winding course along its axis. Information gathered on this and many other flights has made it possible to capitalize on the benefits of the jet stream and to minimize its disadvantages.

In a similar manner, through Mr. H. Harrison, United Air Lines; Mr. J. George, Eastern Air Lines; Mr. C. N. Touart, Air Force Cambridge Research Center; and Dr. R. Fletcher, Air Weather Service, SAC pursues a continuous and aggressive flight research program designed to improve forecasting capabilities.

With more and more emphasis on jet operations, today's forecaster is confronted by problems that arise because modern aircraft operate at tremendous heights and speeds in a medium that man still has much to learn about. The cruise-climb profile of jet aircraft—the flight path that gives a jet its best range and efficiency—requires planes to operate at altitudes that were only dreamed about ten years ago and demands weather forecasts once called impossible to make. The weatherman's chief concern is lack of sufficient data.

Most of the available upper air weather data is centered around the 500-millibar or 20,000-foot level. "Altitude-wise" this fails to satisfy even the lower limits of normal cruise-climb profiles. However, from a weather analyst's point of view, it furnishes a common upper level which, when correlated with surface conditions, gives a three-dimensional picture of the atmosphere. Within certain limitations, the analyst has learned to build his weather picture up and down from the 20,000-foot level. In building upward he was soon confronted with the fact that his constructed picture did not conform with high-altitude conditions flight crews reported. This was particularly true in the tropopause area separating the lower and upper atmospheres.

The tropopause is extremely unstable as a transition zone between two atmospheres and their respective weathers. The tropopause may fall nearly as low as 30,000 feet behind a weather front, or it may ride upward to 50,000 feet over violent thunderstorms in the lower atmosphere. Such varied effects of one atmosphere upon the other at altitudes where it is difficult to obtain accurate weather data taxes the ability of SAC's forecasters—for these are the altitudes at which planes of the command must operate.

That SAC's men continue to fly round-the-clock missions through these comparatively unexplored regions high above the earth is evidence of the efficiency of the command's weather support.

The vastness of the weatherman's laboratory makes his fund of knowledge seem terribly small. Still, the job must be done, the forecasts made. In doing the job, impossible as it once seemed, SAC's forecasters of the world's weather learn a little more every day about the atmosphere. What they learn today makes tomorrow's forecast more accurate and adds that much more to the effectiveness of the Strategic Air Command.—END

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Ryan is a $30 million facility, superbly equipped for its job of serving the aircraft and engine industries and the military services. With 850,000 square feet of factory floor space, Ryan manufacturing includes "big" jobs like the huge Boeing KC-135 mid and aft fuselages and Douglas DC-8 jet engine pods and pylons. With the most modern machine tools for forming, welding, machining and heat treating, Ryan manufactures the exacting jet engine, afterburner, rocket and ramjet components which require surgeon-like skills and intimate knowledge of high temperature alloys.

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SAC *refueling*

Boeing 707 and a B-52 making a test hook-up.

Clancy LOWERS THE BOOM

By Col. E. D. Reynolds

COMMANDER, 4050TH AIR REFUELING WING, SAC

THE IRISH couldn't be prouder of their Clancys than the Strategic Air Command is of a select group of men who answer to the same name—although, really, their names run from Adams to Zegdrowski. It was inevitable that the boom operator of a SAC tanker would be dubbed "Clancy" after the character of the same name. When the Clancy of the song wanted to straighten things out, he really lowered the boom. For peace in our time, "Clancy" of the Strategic Air Command's tankers daily lowers a giant-sized forty-eight-foot aluminum tube. Lying prone on a sponge rubber mat in the tail of a KC-97 aerial tanker, Clancy guides his boom into the gas-filler nozzle of SAC's B-47 and B-52 bombers, as well as the strategic F-84 fighters. As the jet fuel flows into the receiver plane's tank at hundreds of gallons per minute, it is obvious that Clancy is doing his part in providing the "seven league boots" for SAC's nuclear striking force.

Let's listen in on the radio for a minute and see what happens when "Clancy lowers the boom." This is a routine training exercise, held daily to insure that our strategic bomber forces can take off from a base in the United States and fly non-stop to any spot in the world and return.

Esquire Fifty-six is the tanker and he's in his orbit area waiting for business.

"Pigtail Ninety-nine, this is Esquire Fifty-six—do you read?"

"Reading you five square, Fifty-six. Revised ETA [estimated time of arrival] for rendezvous is fifty past the hour."

"Navigator to aircraft commander. I've been listening in and I have him on the scope at one six zero miles."

"OK, old boy, take over."

"P-T Ninety-nine, I have you at range one six zero."

"Roger, Fifty-six."

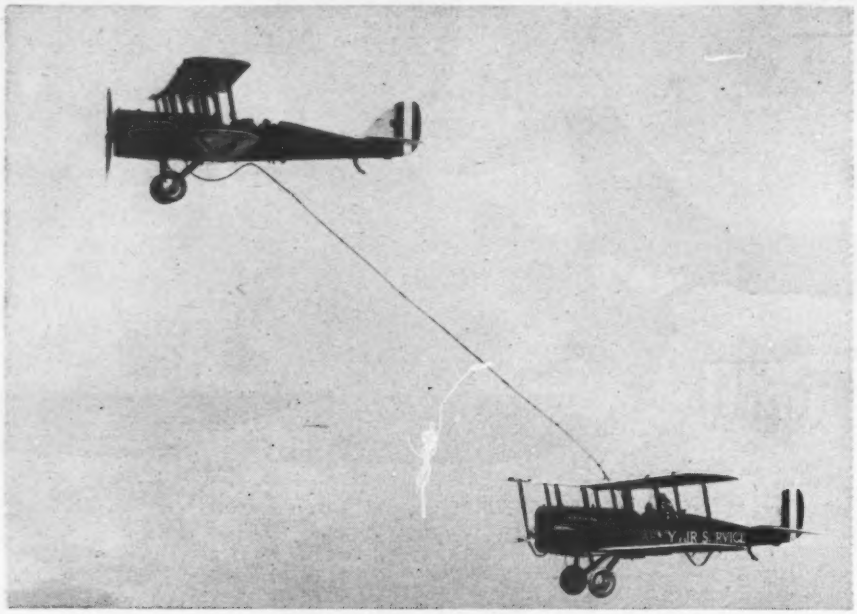
(A little aircraft commander-navigator conversation is usually necessary about this time to make sure that all headings are correct.)

"P-T Ninety-nine, you're now one two zero—correct ten degrees left."

"Roger, Fifty-six—ten degrees left."

(Continued on following page)

In 1929 the Fokker tri-motor "Question Mark" stayed aloft more than three days by refueling in the air. Three who took part (second, fourth and fifth from left) were: Capt. Ira C. Eaker, Maj. Carl Spaatz, and Lt. E. R. Quesada.



Over San Diego in 1923, Capt. Lowell H. Smith and Lt. John P. Richter, using a makeshift hose and funnel rig, accomplished first successful air refueling.

"P-T Ninety-nine, range one hundred—what will be your descent range for formating speed?"

"Fifty-six, descent range thirty-seven, formating speed one ninety-five knots indicated."

"Ninety-nine, range six zero—correct three left."

"AC, ninety-nine is at six zero—start your turn left to two four zero and depart orbit at completion of turn."

"OK Nav, turning left to two four zero."

"Ninety-nine range three zero—take course two four zero."

"Roger, fifty-six."

At twelve miles the tanker stabilizes at 195 knots indicated—the navigator continues to direct the receiver up to a one-mile range and then clears "Clancy to lower the boom" after that it's "Contact Tanker" and "Contact Receiver."

No sweat. All in a day's work.

This tanker crew had a sense of humor too. For in large letters painted on the ruddevators (combination rudders and elevators) of Clancy's boom was: "All credit cards accepted." (Credit card or no credit card, you can always get gas if you say, "LeMay sent me.")

What used to be a stunt has now been developed into an exact science. During 1955, the forces of the Strategic Air Command accomplished an average of one aerial refueling every three and one-half minutes throughout the entire year. This was done in all kinds of weather, both day and night, in summer and in winter. Single airplanes and mass formations were all refueled on schedule. That's not a stunt.

Aerial refueling, which has brought the entire world within the range of SAC's atom-bomb-carrying airplanes, was first tried more than twenty years ago, but became a practical, everyday technique within the last five.

Basically, aerial refueling was a military development. It was first done successfully over San Diego in June 1923 by two young lieutenants—Lt. Lowell H. Smith and Lt. John P. Richter—who used a makeshift hose and a funnel rig to transfer a mere twenty-five gallons of gasoline from one airplane to another. Six years later, young officers exploited the refueling idea by setting an endurance record of 150 hours, forty minutes, and fifteen seconds in the "Question Mark," a Fokker tri-motor. During World War II three of the officers on this history-making aerial refueling flight gained international fame. These three enterprising pilots were Maj. Carl (Tooey) Spaatz, Capt. Ira Eaker, and Lt. Elwood Quesada.

After World War II, SAC began working on its refueling technique, using B-50 bombers and a modified refueling system developed by the British. The British gravity flow system proved too slow, so US technicians added pressure to it, making it possible to pump over 500 gallons of fuel per minute. The boom replaced the earlier hose, and it brought "Clancy" into the picture.

The old expression, "There's nothing new under the sun," certainly doesn't hold true in this aerial filling station business. As fighters and bombers fly faster and higher, we in the refueling business are hard-pressed to give them a load of fuel in mid-air and let them continue on the mission with as little interference as possible. Just a few years ago we were dangling a rubber hose out the rear end of a modified B-29, sometimes taking up to an hour and one-half to off-load comparatively few gallons of fuel by the gravity feed method. Today we've got a jet prototype tanker, the KC-135, which can refuel our planes at speeds above 500 miles an hour and at altitudes in excess of 35,000 feet. SAC's aerial refueling is something like an advertising slogan used by a roadside hamburger stand on the Houston-San Antonio road. The sign says: *"He didn't invent the hamburger, but he did perfect it."* SAC didn't invent aerial refueling, but it certainly perfected the technique.

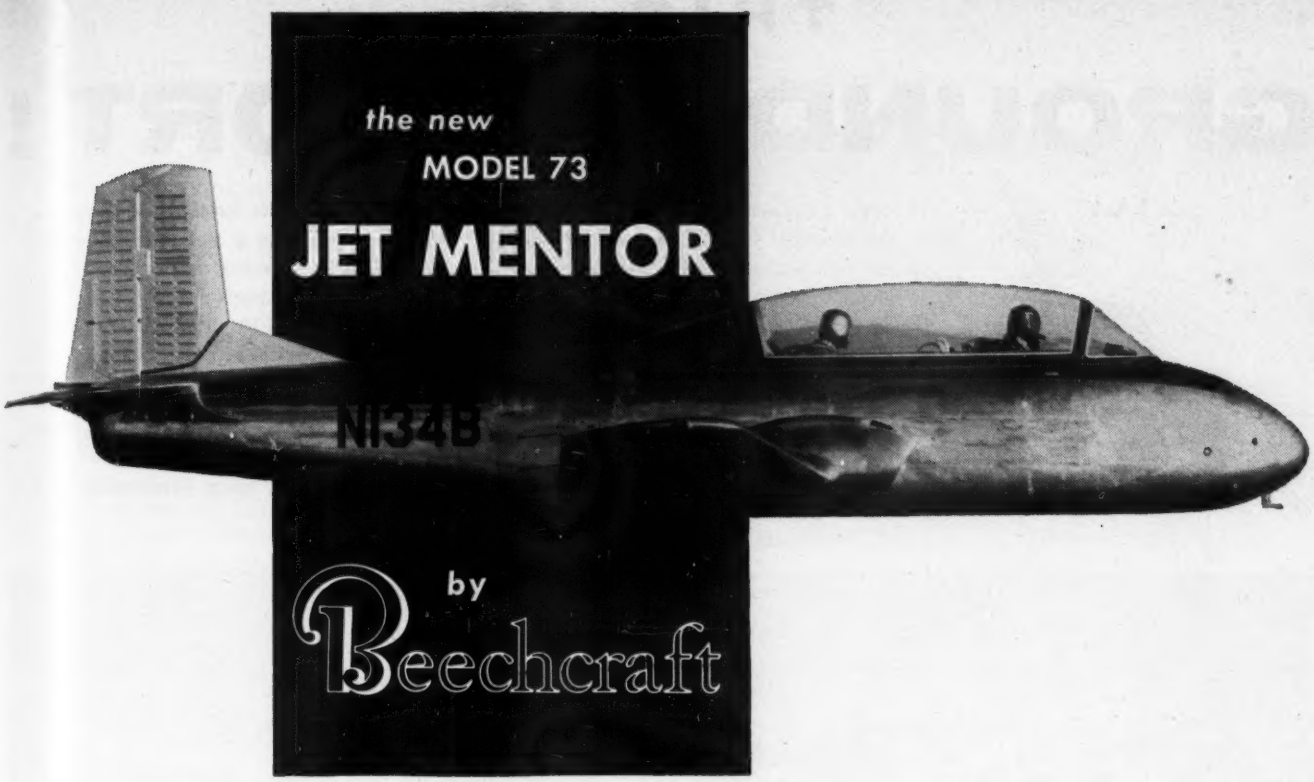
COL. E. D. REYNOLDS

Born in Jacksonville, Tex., in 1909, Col. Reynolds attended Texas A&M before entering cadet training in 1934. He was with the US Air Mission in Cairo, Egypt, in '41 and in WW II served in the Pacific with the 314th Bomb Wing, becoming wing CO in February 1946. He served at the NATO Defense College in Paris before assuming his present assignment at Westover AFB in 1955.

On March 2, 1949, an Eighth Air Force B-50 Superfortress, "Lucky Lady II," piloted by Capt. James Gallagher, touched down on the runway at Carswell Air Force Base, Fort Worth, Tex., completing man's first non-stop flight around the world.

The B-50 left Carswell shortly after noon on February 26, 1949, and returned to its base ninety-four hours and one minute later after a flight of 23,450 miles at an average speed of 249 miles per hour. It had been refueled four times by KC-29 tankers from bases in the Azores, Saudi Arabia, the Philippines, and Hawaii. This mission was a big factor in establishing new refueling procedures and improving all equipment. Other missions flown in the Arctic tested the operating capability of the hose equipment. Units equipped with this

(Continued on page 77)



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In flight and handling characteristics the two airplanes are so alike that transition from one to the other will be a very simple step for a student; or in fact the student could start his training with the Jet Mentor without previous flight experience. Inquiries are invited.

The Beechcraft Model 73 Jet Mentor
PERFORMANCE AND SPECIFICATION DATA

(Engine: Continental J69-T-9 Turbojet)

Cruising Speed	245 mph
High Speed (at 15,000 feet)	295 mph
Diving Speed	500 mph
Service Ceiling	28,000 feet
Range (maximum with reserve)	450 miles
Gross Weight	4,521 pounds
Empty Weight	2,925 pounds
Useful Load	1,596 pounds
Load Factor (ultimate)	11.25 G's
Rate of Climb	1,400 fpm

Beechcraft

Beech Aircraft Corporation, Wichita, Kansas, U. S. A.

BEECH BUILDS: T-34 Trainers for the USAF and USN; L-23 Transports for the U. S. Army; the Model 73 Jet Mentor; MD-3 Mobile Power Generators; and for Business — the Beechcraft Super 18 Executive Transport, the Beechcraft Twin-Bonanza and the Beechcraft Bonanza.

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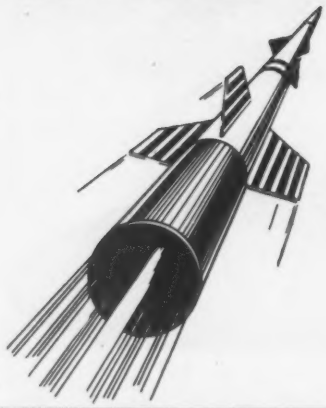
GROUND SUPPORT!



The complex requirements of missile and piloted aircraft mean constantly stricter demands of ground support equipment. In this field, CONSOLIDATED has developed a wide range of single and multi-purpose units designed for both missiles and piloted aircraft. The compact Model 2100, for example, a self-propelled multi-purpose unit . . . . performs every function of electrical hydraulic and pneumatic testing . . is capable of servicing and starting guided missiles and jet air-craft quickly, surely and under the most difficult operational conditions . . . and can be used for heavy duty towing as well. It provides:

- **HYDRAULICS . . . 10 GPM, 3000 PSI variable volume, pressure compensating.**
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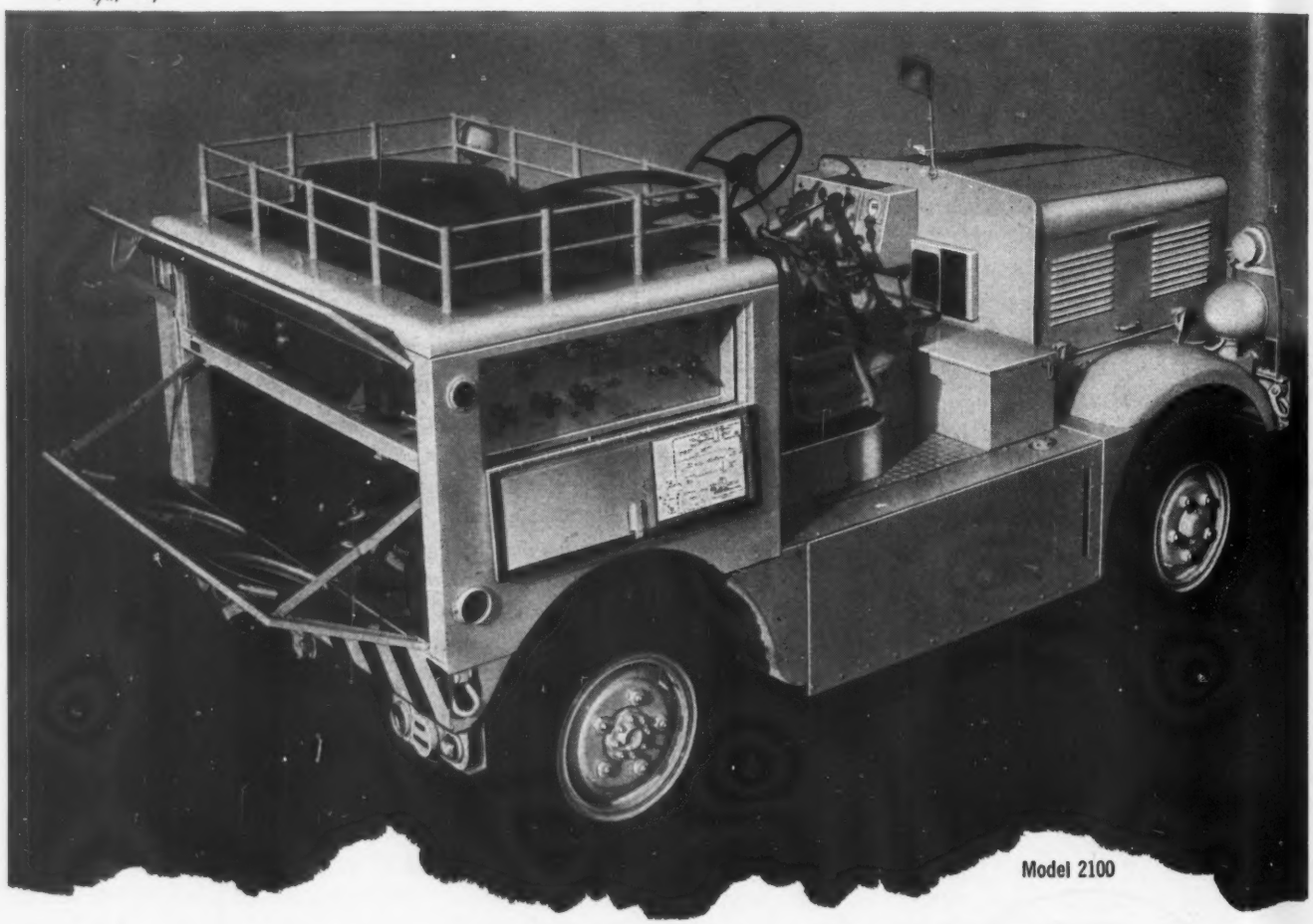

Model 2100

OTHER MODELS OF SINGLE AND MULTI-PURPOSE GROUND SUPPORT EQUIPMENT ARE in active use with U.S. Air Force, Navy and Marine Units . . available with any combinations of . . AC and DC power . . high pressure air, hydraulics, and low pressure air . . refrigeration and heating.

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system were sent to all parts of the world for further testing.

Using this equipment many types of formation refuelings were attempted, but not with the mass results desired. The success of this type of air refueling depended upon the tanker aircraft commander's skill in formation flying. To train tanker aircraft commanders was requiring more flying time than is now allotted to train an entire tanker crew. Realizing the limitations of the adapted British hose equipment, SAC Headquarters called on Boeing Airplane Company.

In 1950 the B-29, later designated the KB-29P, was equipped with the Boeing flying boom.

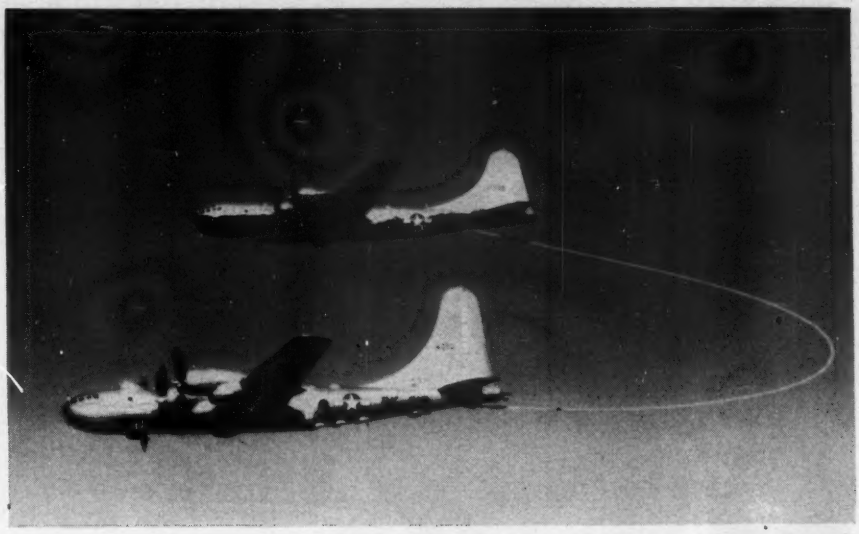
The boom system gave us a much faster rate of fuel flow and more flexibility in selecting favorable weather and altitudes. With a telescoping boom that could be flown up, down, or to either side, the positive position of the tanker and receiver aircraft could vary to some degree. This system reduced by half the time required to train a tanker pilot.

Some major malfunctions had to be corrected later as Strategic Air Command crews and maintenance personnel became better acquainted with the system.

Besides improving refueling, the flying boom provided an added dividend that wasn't in the book. Recently an F-84 had a flame-out while being refueled. Attempts at an air start proved unsuccessful, so the enterprising tanker crew towed the fighter pilot past his home base where he was turned loose and glided in for a dead-stick landing.

Until March of 1951, our only tankers were modified World War II bombers, but Boeing's KC-97A Stratofreighter tanker, which successfully refueled a B-47 jet bomber in flight on March 15, 1951, proved a major factor in making full-scale air refueling feasible. Although KB-29s would continue to be used for some time, aerial refueling had come of age and the tanker was no longer a mutation—it was an aircraft type in its own right, as much so as a fighter, a bomber, or a transport.

General LeMay, although long an exponent of the truly intercontinental bomber, recognized that such an aircraft would not be available in the immediate future. So he turned his efforts to the development of our capability to conduct intercontinental bombing through refueling. This meant that the tanker would have to become an integral part of the bomber's mission and all uncertainty would have to be eliminated from the technique. We could not afford to base our strategy solely on a network of foreign bases over which we could not definitely be assured of positive control. Neither could we base our strategy on an operational procedure that was not foolproof.



On one of the four refueling contacts it made on the first non-stop 'round-the-world flight in 1949, the B-50 "Lucky Lady II" gets fuel from a KB-29M.

Therefore, in early 1952, it was realized that the tanker procurement program, both for aircraft and crews, must be increased. Such a high priority was placed on this program that bombardment crews training at Randolph Air Force Base for participation in the Korean conflict were withdrawn and replaced by a higher priority program—the transitioning to the KC-97.

The KC-97 extended the range of the B-47 by one-third to one-half. Between 1952 and early 1954, however, when tanker squadrons began to become combat ready, most B-47 aerial refuelings were merely token offloads in comparison to those of today. It was not until the latter part of 1954 that we began planning missions whose success depended entirely upon a successful air refueling. By the end of that year, tactics had been developed whereby large flights of B-47s could be refueled in formation, dependent, however, upon daylight flying and relatively clear weather.

During this time, many records were being established. A transoceanic mass jet flight completed by fifty-eight F-84 Thunderjets of the 31st Fighter-Escort Wing further demonstrated the place of aerial refueling in modern military aviation.

In October of 1952, seventy-five F-84s of the 27th Fighter-Escort Wing completed the longest known over-water flight by single-engine jet fighters from Midway to Japan. The first flight, led by Col. John Blakeslee, refueled in the air and covered 2,575 miles.

In January 1955, SAC Headquarters concluded that the aerial refueling problem during daylight hours and good weather was practically solved. Missions could be planned doubling the range of the B-47. However, to increase the range still further and to guarantee proper timing, training missions calling for mass night refueling and poor visibility conditions were necessary. Tanker crews in the Fifteenth and Second Air Forces had been experimenting with certain tactics to enable formations of tankers to refuel formations of bombers at night with visibility down to one mile. These tactics were tested between March 1955 and August 1955, when they were placed in the Tactical Doctrine and became standard operating procedure for all of the Strategic Air Command.

Since August 1955, enormous strides have been made. Today it is common to schedule a B-47 to fly three times its maximum capable range by scheduling two or more air refuelings en route. Strategic Air Command air crews now are averaging 2,880 contacts a week—one aerial refueling every three and one-half minutes around the clock.

Our present high degree of skill in the art of aerial refueling is the result of painstaking staff work and countless hours and days of experimenting. The number of actual hookups are numbered in the six figures.

Last year SAC introduced a new concept in tanker organization. Two

(Continued on following page)

Let Clifton Size 8's take the place of larger synchros at very significant savings in weight and bulk, yet at no sacrifice in accuracy or reliability.

In airborne equipment, why load on unnecessary weight?

By the early introduction of our Size 8 Synchro Series, we figure to have saved the Air Arm 1 Ton of dead weight in 1956 alone.

Samples from stock, quantities from the production line.

Write for complete electrical data.

cppc SIZE 8 SYNCHROS

ACCURACY 7 MINUTES
WEIGHT 32 GRAMS

LOOK TO cppc FOR SYNCHRO PROGRESS

CLIFTON PRECISION PRODUCTS CO., INC.
CLIFTON HEIGHTS, PA.

REFUELING——CONTINUED

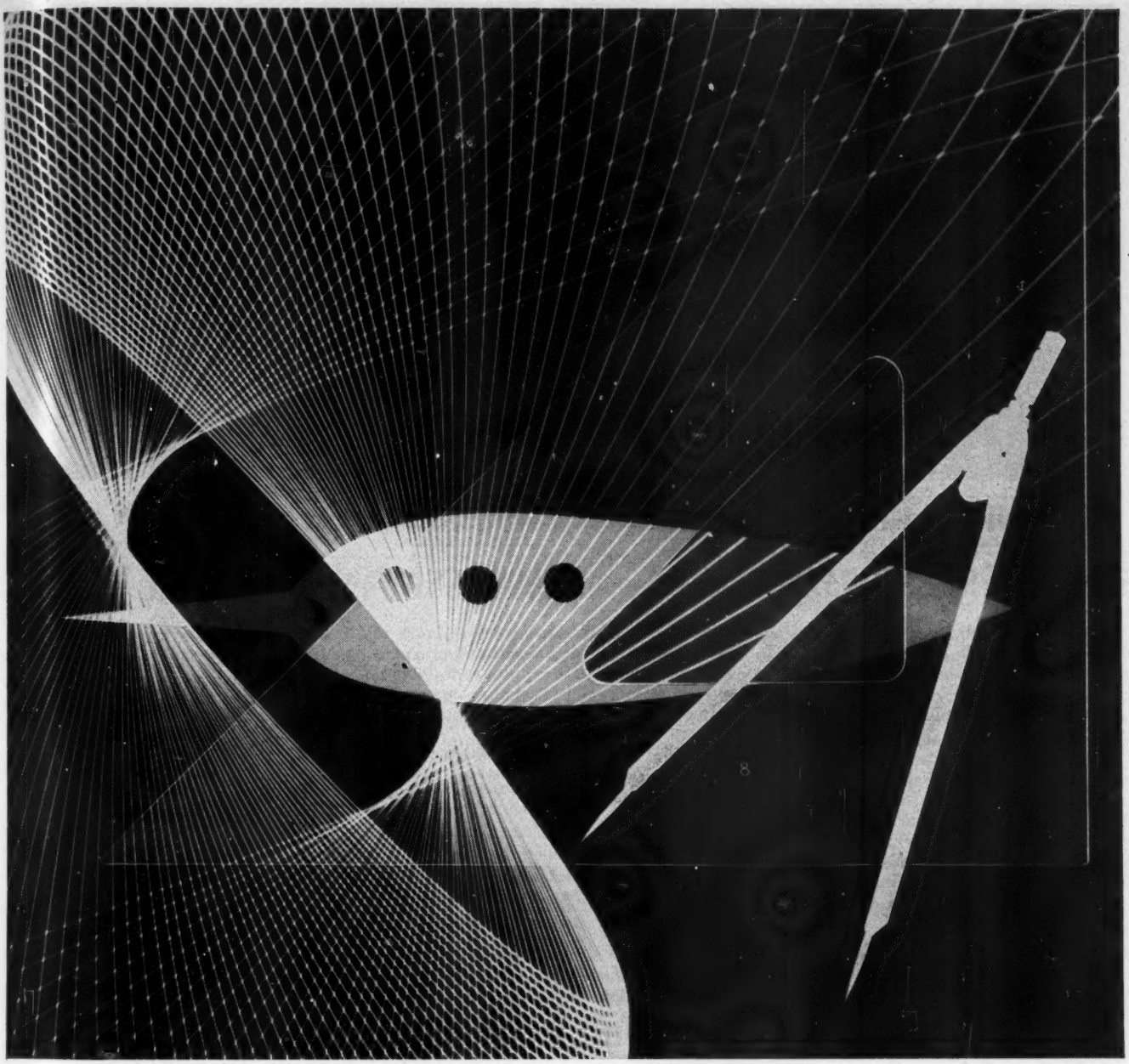
Eighth Air Force bases—Westover AFB, Mass., and Dow AFB, Maine—became the homes of air refueling wings, completely independent of SAC bomber wings. These wings were given a geographical area of responsibility. Instead of refueling the aircraft of one tactical organization, these wings now are responsible for all refueling within their area.

This was done for several reasons. Tanker squadrons are often called upon for support missions on TDY (Temporary Duty) movements, beyond their bomber wing commitments. By establishing a refueling wing, the problem of refueling at home while a squadron is absent on TDY has been solved since the rest of the wing remains in place. Furthermore, the consolidation of tanker units is more efficient because all personnel have only one job—air refueling.

The current production models of the KC-97G serve not only as tankers, but also as personnel and cargo transports. As SAC converted to jet bombers, the need for a jet tanker became evident. Experiments in air refueling between two B-47s proved the feasibility of a jet tanker. The Boeing Airplane Company was again given the job. The Air Force has now standardized and placed into production an advanced tanker version of the Boeing Model 707 jet prototype, to be known as the KC-135. These will be available in quantity in the near future.

The KC-97G carries its fuel for transfer in fifteen tanks located on the upper and lower decks of the double lobe fuselage and in two wing tanks. The seven tanks on the main deck are stacked two high along the left side of the airplane. This arrangement is an improvement over the KC-97E and F models which carried the transferable fuel in four large tanks installed in the upper deck only. With the new configuration, ample room remains in the upper deck for transporting cargo or personnel without removing the tanks. This greatly increases the mobility of the Strategic Air Command tanker fleet.

The result of all of this is a professional tanker force, with flexibility as its keynote and reliability its stock in trade. Its one mission in life is the accomplishment of the bombing mission, because the tanker has a bombing mission as surely as the bomber. The pilots of our tanker force are proud of their mission, and they're prouder still of their contribution to the security of our nation.—END



Pre-flight tests of AUTONETICS flight control systems are simulated in special analog computers while the planes that will use them are still on the drawing board.

Now man can fly a plane before it's built

For many years there were problems in the design of aircraft which could not be solved practically except by trial and error—a slow, costly, often dangerous method.

Today much of this guesswork and time, as well as some of the hazard, has been eliminated—thanks to newly designed electronic devices. Now specially designed computer systems simulate on the ground actual conditions of supersonic flight...help predict the performance of aircraft which are still on the drawing board.

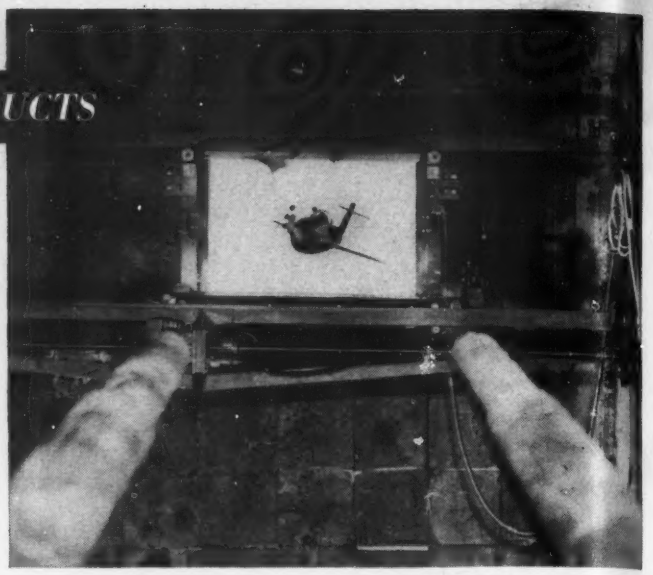
Although actual flight will always be the final test of any aircraft, these special uses of computer systems by the AUTONETICS Division of North American Aviation are daily helping solve complex problems in less time and with more certainty than ever before ...speeding scientific break-throughs in the whole intricate field of advanced electro-mechanical systems—auto pilots, auto navigators, automatic armament controls, and other automatic control systems.

If you have a professional interest in this field, either as an engineer or manufacturer, please write to AUTONETICS, Dept. F-2, 12214 Lakewood Blvd., Downey, California.

Autonetics

A DIVISION OF NORTH AMERICAN AVIATION, INC.

AUTOMATIC CONTROLS MAN HAS NEVER BUILT BEFORE



Problem: To cut armament system development time

Solution: New G-E DYNAT reduces need for flight test.

DYNAT—that's the name General Electric gives to its new Dynamic Accuracy Tester which can now evaluate complete airborne armament systems during ground firing under fully simulated flight conditions.

Combat readiness of airborne armament systems can be evaluated only by complete testing; so extensive flight tests are necessary to duplicate actual armament system environmental conditions. This procedure is expensive, time consuming and gives only a sampling of a system's performance. DYNAT solves this testing problem by simulating on the ground the situations expected in aerial combat. In this way Dynat saves time and money and gives a complete evaluation under all conditions required for combat readiness.

General Electric believes it has the answer to this problem with DYNAT; here's why:

1. Simulates air battles on the ground
DYNAT can be used for complete armament system and component evaluation. It tests the actual radar tracking and actual gun firing errors while the computing system is functioning. It consists of a group of units designed to simulate the duel conditions and provide continuous evaluation records of the problems that an armament system meets during the actual duels.

2. Tests effects of own ship's motion
DYNAT tests the ability of the armament system to compensate for its own ship's motion.

3. Radar noise
DYNAT can test the effects of radar noise, either atmospheric, system, or target generated.

4. Shock and vibration testing
DYNAT can test the effects of ship's vibration, shock, and any other circuit noise that might be encountered in actual flight firing.

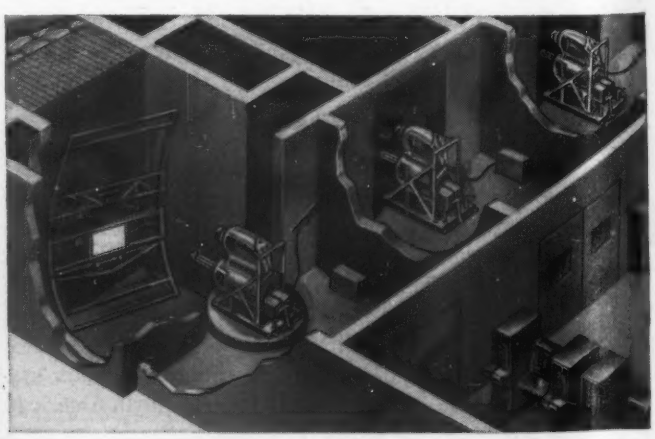
5. Windload effects
Windload conditions on the armament system with DYNAT can be simulated with weights and shock cords such that the proper load is applied to the weapon for a given angle of firing and condition of flight.

6. Complete environmental testing
Installation of DYNAT in G.E.'s all-angle firing lane permits full firing evaluation at any temperature from −100 F to +160 F.

DYNAT SIMULATES ACTUAL FLIGHT.
Every flight condition can be simulated by DYNAT. The fire control system tracks, computes, and *fires* in an environment which closely approximates its operational habitat; the effect on the armament system can then be evaluated through DYNAT. DYNAT results can then be checked airborne by flying only a fraction of the flights required on present full-scale airborne tests. The fact that DYNAT can simulate actual flight tests relatively quickly and inexpensively will permit the accumulation of statistical data from a far greater number of simulated air-duel courses than is normally possible in actual flight testing.

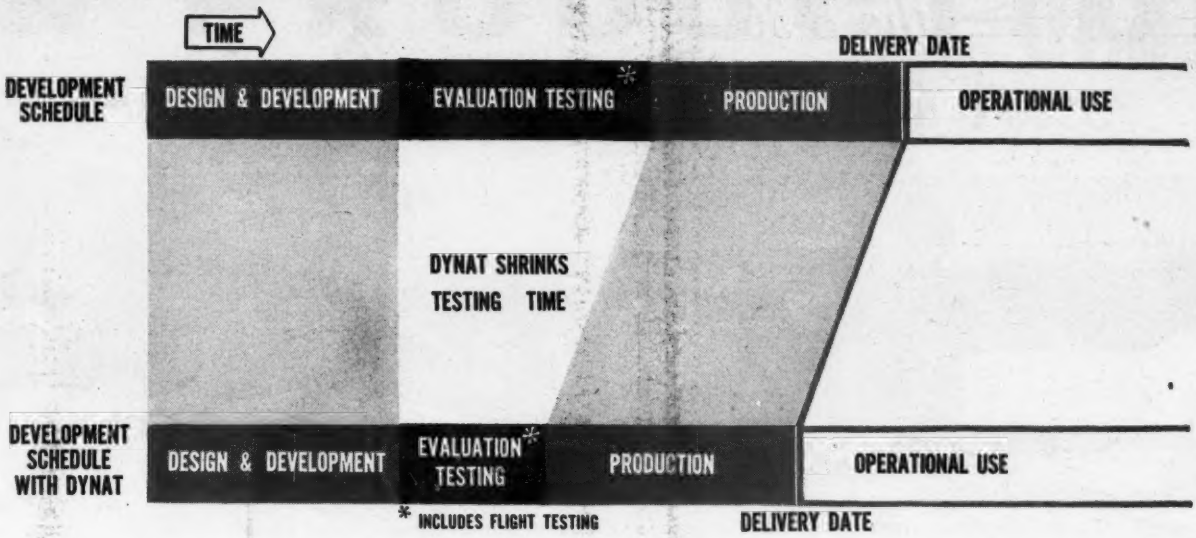
For more information on DYNAT, contact your nearest G-E Apparatus Sales representative, or write for bulletin GEA-6345, General Electric Company, Section 210-99, 1 River Road, Schenectady, N. Y.

DYNAT control console records both correct answers to attack problem and armament system's computed solution.



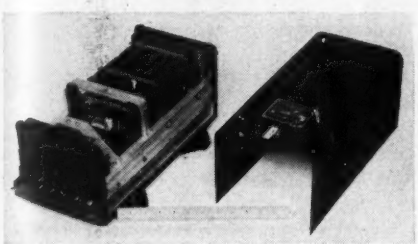
Foreground shows General Electric's all-angle firing lane with DYNAT installed. Console is in outer control room.

Here's how DYNAT reduces over-all development schedule



DYNAT's ability to reduce evaluation testing time will help to get operational systems in service sooner.

G-E Transformer-Rectifier operates at higher ambient temperatures



Weight of new unit is only 23.5 lbs.

General Electric's latest addition to a new line of transformer-rectifiers is model 6RS705F2. Weighing only 23.5 pounds, it actually betters the demands of MIL-P-7212 requirements. It can operate without derating up to 60,000 ft. at 20 C, or at sea level up to 110 C. A 5 KW unregulated unit for use in missile applications has also been developed, weighing 32.5 lbs. and a new design of a 12 amp. (4½ lbs.) unit has been completed.

OTHER DESIGNS AVAILABLE.

Many designs are available along with application engineering services on new and very special units, including units without built-in cooling means which can be utilized with blast cooling furnished. Silver-zinc battery charging tests have been made on the 200 amp regulated units, and test reports are available on request.

Latest G-E developments indicate that an 18 lb., 100 amp unregulated unit is now possible (MIL-P-7212), and a 55 lb., 200 amp regulated unit is in the immediate future. To reduce weight of regulated units, new circuit developments are being investigated such as the use of zener diode reference circuits and ampliformers. Use of Silicon broad area rectifiers is under study.

General Electric has done pioneer work in reducing size and weight of regulated and unregulated airborne power supplies. Check your nearest G-E Apparatus Sales representative for further information, or write for bulletin GEA-6443, Section 210-99, General Electric Co., Schenectady 5, New York.

New servo motor operating on B-47

Developed as part of a servo mechanism in the gun directional computer system for the B-47, General Electric's new miniature d-c aircraft motor is but 1⅝ inches in diameter. Weighing 8 ounces, it operates equally well at sea level or at 50,000 ft. provided the ambient at altitude is at the lower end of the temperature range as stated in the general motor specifications.

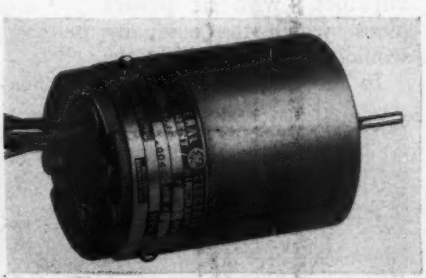
DESIGNED FOR THESE APPLICATIONS

The new motor is designed to meet the intent of the military specification MIL-M-8609 (ASG), and the extreme environmental conditions of this spec for short periods of time. It can be used as a prime mover in a gun directional computer system, in electronic devices, and can be modified for other aircraft and missile applications requiring a reversible motor capable of giving a high speed of response. It can also be geared to very low speeds where applications dictate.

NEW MOTOR HAS THESE FEATURES

Rated at 0.002 hp at 6500 rpm, the new, miniature d-c motor is built with Nicalloy punchings and pole pieces to meet the rigid humidity requirements given in the specifications. It is not restricted to any one type of operation, but has the advantage of a small time constant and good efficiencies in applications where small power outputs are required.

For further information on this new motor check your nearest G-E Apparatus Sales representative or write for bulletin GEA-6314, Section 210-99, General Electric Co., Schenectady, New York.



G-E servo motor is used in B-47 gun directional computer system.

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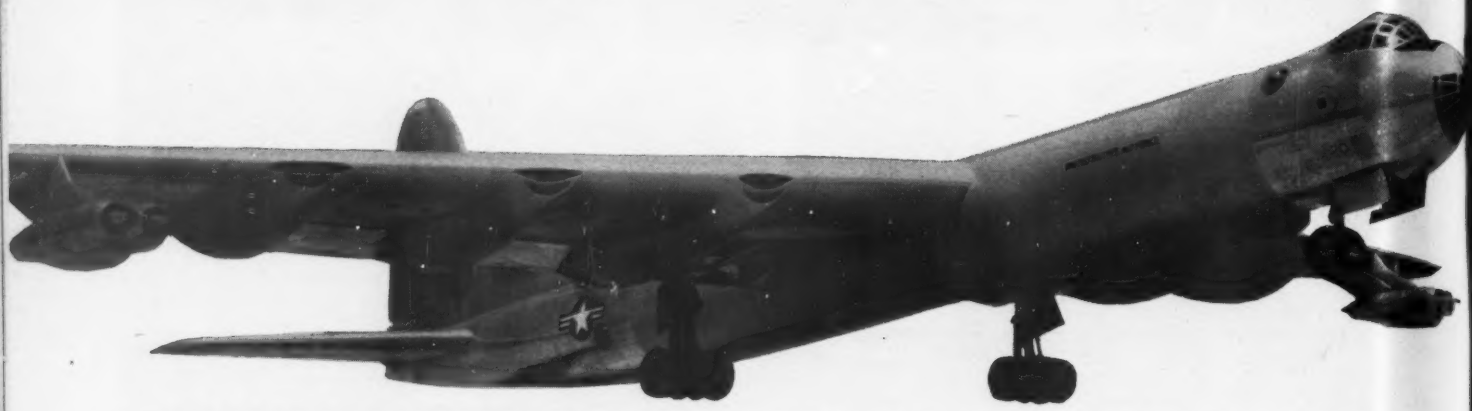
GENERAL ELECTRIC

SAC — *the B-36*



Convair B-36D. Before Pearl Harbor the AAF set up requirements for the bomber that would change the concept of war.

Veteran of the Dry-Run War

By Brig. Gen. Edwin B. Broadhurst
COMMANDER, 57TH AIR DIVISION, SAC

THE story of the B-36 begins in 1941, several months before Pearl Harbor. One must think back about the world situation at that time to realize what prompted the building of the B-36. In Europe Hitler's armies were moving into the free territories at a frightening rate. Britain, fighting against overwhelming odds, seemed near defeat.

The situation faced the United States with an awesome prospect—having to contend with the Nazi war machine almost singlehandedly. Without European allies, the United States would have been left without any air bases from which to launch an attack against a European battlefield.

If the worst came, as appeared probable, America would need to be able to wage aerial war from the North American continent. At first this requirement seemed insurmountable. But the prospect of an airplane that could take off from available bases and hit the Axis was too valuable an idea for us to lay aside without exploring every possibility. And so it happened that eight months before Pearl Harbor, the Army Air Corps set up requirements for the bomber which would change the concept of war.

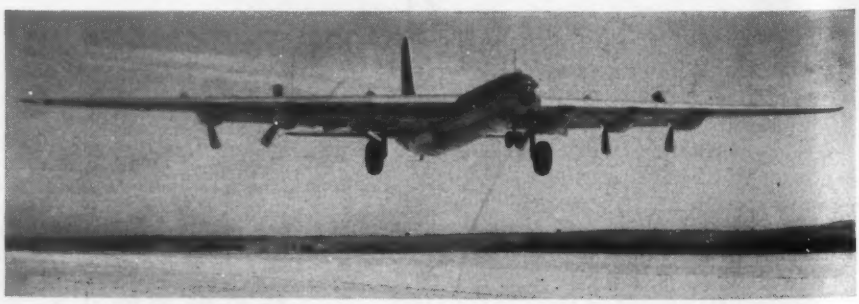
Specifically, the Army Air Corps was asking American engineers for a bomber that could carry a 10,000-pound bomb load to a target 5,000 miles away and return non-stop; haul 72,000 pounds of bombs at reduced range; travel 300-400 miles per hour; and take off and land on a 5,000-foot runway.

Design competition for this first intercontinental bomber began on April 11, 1941. In October of the same year, Consolidated Aircraft Corporation submitted a proposal to "develop and construct two experimental long-range, high-altitude, bombardment airplanes," with six pusher-type engines, which the company believed would meet all specifications.

In meeting these design specifications, and knowing the role the airplane was to play as a tactical bomber in a strategic fleet, the designers came up with the largest airplane ever built. The planning and design, however, were to offer one of the major objectives of aircraft design—maximum growth potential. This potential and versatility insured the planners that the aircraft could be modified and improved as newer and larger weapons were produced for aerial delivery.

As our European and Pacific campaigns progressed, the production of other aircraft was necessarily emphasized. These aircraft were using overseas bases which permitted short-range attacks against the enemy, a

(Continued on page 85)



Convair's experimental XB-36 bomber roared into the air for the first time on August 8, 1946. The single-wheel landing gear was replaced by improved gear.

IN PRODUCTION

—the new work horse of the Air Force

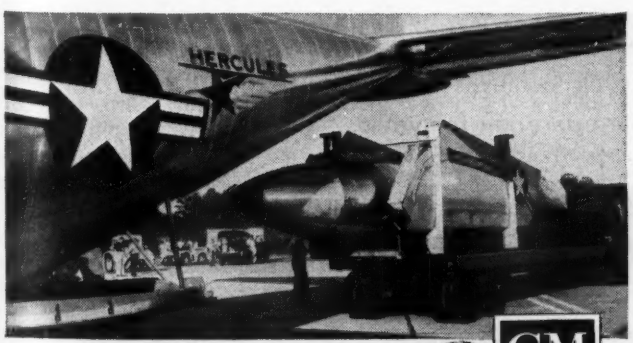
Lockheed C-130 Hercules to provide jet age transport speed with Allison Turbo-Prop Engines and Aeroproducts Propellers

Now in production at Government Aircraft Plant No. 6, Marietta, Georgia, the Air Force's first turbo-prop transport before long will begin active service with the USAF Tactical Air Command.

Powered with four Allison T56 engines and Aeroproducts Propellers, the new Lockheed Hercules will add speed and load-carrying ability to the logistics support of our jet-powered combat forces.

Now undergoing the rigid test of cold weather operation in the climatic test hangar at Eglin AFB—home of the Air Proving Ground Command—the C-130 will be proved fit and ready when it reports for duty some time this year.

Already the matched team of Allison engines and Aeroproducts Propellers stands as the most thoroughly proved turbo-prop power package in America. In military – as well as in commercial service – it is ready to take its place in the jet age of air transportation.



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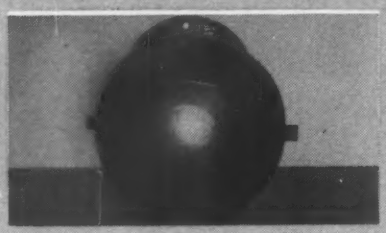
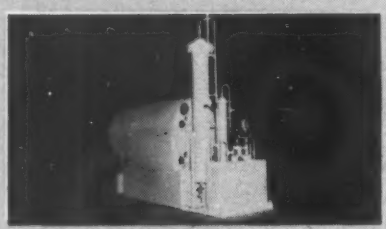
AMERICAN BUILT FOR THE JET ERA IN AIR TRAVEL

4,000 Gallon Transport Dewar

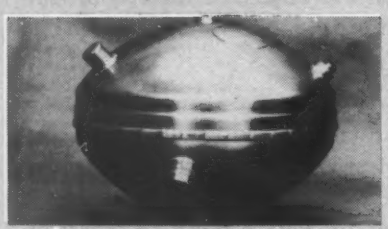


Fuming Nitric Acid Container

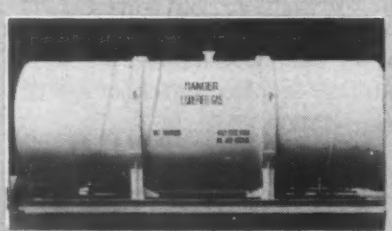
50 Gallon Liquid Oxygen Transport Dewar



Helium Purifier

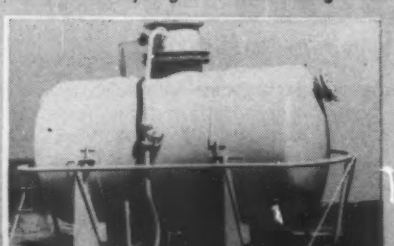


5 Liter Liquid Oxygen Container



2160 Gallon Liquid Oxygen Container

1300 Gallon Hydrogen Peroxide Storage Tank



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CREATORS IN CRYOGENICS

type of operation made possible because the enemy had chosen to concentrate on developing and producing fighters for close support rather than bombers for strategic uses.

World War II came to a climactic ending in August 1945, when a B-29 of our aerial fleet dropped a new weapon on Japan. To most of us, "atomic bomb" was a new term. We had to be told again and again about the destruction of Hiroshima and Nagasaki before we could really comprehend the bomb's significance.

The atomic bomb changed the concept of aerial warfare. American leaders, accepting this fact, realized that in its initial phase any future war would be limited to the delivery of massive destruction to the heartland of participating nations. The initial blow might come without warning, and the size of the initial wave could well determine a nation's future existence.

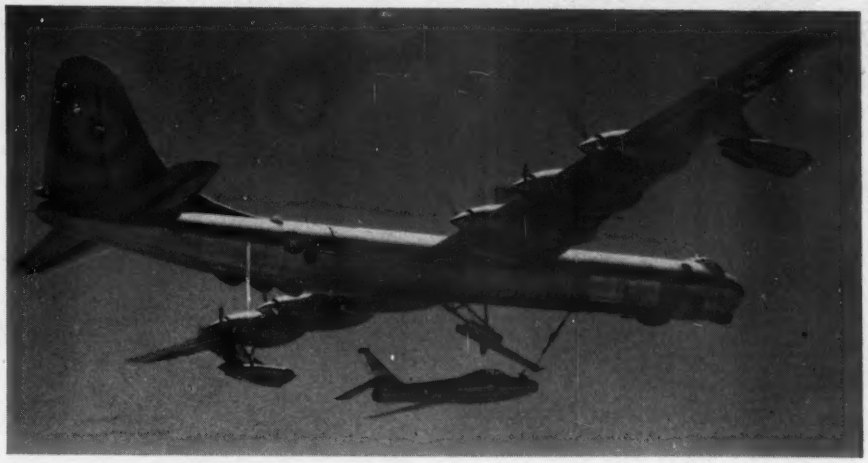
BRIG. GEN. E. B. BROADHURST

Born in 1915 in Smithfield, N. C., General Broadhurst is a 1937 graduate of West Point. He received his wings in 1939, moved with the 19th Bomb Group to the Pacific early in WW II. He served as plans officer at Allied Hq., Southwest Pacific, the rest of the war. With various assignments after the war, he became SAC Chief of Plans in 1950, and Commander of the 5th Strategic Recon Wing in 1953.

The USAF, then, had to develop a powerful strategic force in being, able to deliver such massive retaliation that any aggressor nation would hesitate to launch an attack against our homeland. Part of the fleet had to be able to launch additional sizable strikes from our North American bases. The B-36 gave us this capability. The concept was adopted as our national policy, and the B-36 was brought into SAC to serve as the backbone of this new force.

What started with the nucleus of planners and designers in 1941 was to become the key to American defense in a new era of atomic warfare. At the war's end, engineering manpower was shifted to the B-36 program, and on August 8, 1946, the XB-36 roared into the air on its maiden flight.

With the initial reaction to the new concepts of atomic aerial warfare behind, history now provides air planners with the factual story of how the B-36 has enabled us to live for ten years free from aggression.



A jet fighter can be launched and retrieved by one version of the B-36—the GRB-36. Here an RF-84 makes contact with the retrieving mechanism in flight.

Early estimates of the airplane's capabilities have been conservative. As more powerful engines and better equipment became available, Convair incorporated improvements in the early models. One modification, first flown in 1949, was equipped with four jet engines as well as six piston engines, almost doubling the amount of power of the aircraft. With these improvements, we now had an aircraft capable of gross weight take-offs in excess of 400,000 pounds. We had an aircraft that could defend itself with its sixteen 20-millimeter cannons—more firepower than any other known bomber. In its final modified form, the huge bomber dropped 84,000 pounds of bombs, climbed above 45,000 feet, flew more than 400 miles per hour, and, in general, proved to the world that the United States had a "big stick" for defense.

Another very important development was the conversion of the bomber to a high-priority reconnaissance aircraft, designated as the RB-36. In addition to bombs, the RB-36 carried the large cameras and other special equipment needed for long-range, high-altitude reconnaissance. In the forward bomb bay, for example, were fourteen different cameras, including one with a forty-two-inch focal length lens, capable of mapping a strip of land thirty miles wide and 3,000 miles long. This was probably the largest photographic set-up ever designed for an airplane.

Delivery of the final B-36 meant that all ten of SAC's B-36 wings—from Maine to California and from Washington to Puerto Rico—were fully equipped, and the "Sunday Punch" of SAC had been realized.

When the B-36 was accepted, it not only met the basic requirements but could be adapted to newer and larger weapons. These modifications—increased engine power and greater gas-carrying capacities—gave us an air weapon that could meet a variety of requirements for conducting strategic aerial warfare. We could now carry any of the entire family of atomic and thermonuclear weapons to strategic portions of the globe. We had a plane that could carry larger and more effective photographic equipment to survey possible enemy targets. We had a tough, reliable aircraft that sustained the convictions of the leaders who placed a major responsibility for global airpower on its broad wings, and the crews that manned her.

All during the ten-year period since the end of World War II, weapon advancement was constantly under way. Scientific and industrial knowhow produced new and larger weapons. Again, the big bomber proved to have been a wise selection because the B-36 was the only aircraft that could carry the thermonuclear weapon within her bomb bays. Never before in the short history of airpower has an air force possessed a machine that was so adaptable to rapid changing weapons systems and engine developments.

The manner in which SAC crews have used the B-36 to carry out the assignment of preserving the peace is worth examining.

In 1953, for example, the 92d Bombardment Wing, based at Fairchild AFB, Wash., took part in a mission called "Operation Big Stick," which took the wing to the Pacific area on a thirty-day exercise. The B-36s, in this instance, were poised at a strategic

(Continued on following page)

time during international tension, and in a manner which could leave no doubt that this country intended to use every method available to preserve world peace. By flying non-stop from the United States to bases in Japan and the Far East, our airmen showed unfriendly nations that this fleet of bombers could have easily flown to any enemy targets and have landed at these same bases. The 92d Bombardment Wing received an Outstanding Unit Citation for its part in the maneuver.

This maneuver was not the only occasion on which the Peacemaker fleet was deployed to the right place at the right time. The Strategic Air Command is continually rotating tactical units to strategic locations for operational training, which gives us an upper hand for delivering a lethal blow in the event world hostilities become a reality. Today a portion of the B-36 fleet may be in the Arctic; tomorrow, the Pacific; and next week, in the Atlantic Ocean area. These forward elements as well as the remaining fleet at home bases are ever ready to accomplish the missions assigned to them.

Never has the B-36 dropped a bomb in anger—but its poised might has been a tremendous deterrent to war. Pictured are 130 500-pound bombs it can carry.

In SAC's competition for keeping its crews sharp, this 92d Bomb Wing B-36 crew placed second to a B-47 in 1955. From left: Maj. John Denton, Engineer; Lt. Col. Bob Garner, A/C Commander; Lt. Col. Wm. Barnidge, A/C Commander; Maj. Sterling Winters, Navigator; Maj. Vernon Piotter, Bombardier; Lt. Wm. Montgomery, Observer; Majors John Morrow and Emmett Stewart, Navigators.

RB-36 carries bombs and cameras. Second photographer, S/Sgt. Russel K. Grimes (left) aims his camera while first photographer M/Sgt. Richard J. McBride photographs from his panel.

SAC training programs include a varied array of competitions between tactical units within the command. The best known of these is the annual SAC Bombing and Navigation Competition. During this "World Series" crack crews are flying and "bombing" against each other on a point by point system, in a contest where precision teamwork alone can bring forth a winner. High performance standards of SAC crews are maintained through these competitions, which also are valuable in showing what the aircraft can or cannot do.

The flexibility of the B-36 and the essential role assigned under emergency war plan, places stringent requirements on her crews in order to keep SAC fully prepared. Many hours of flying time are involved in addition to the continual training before an officer fulfills the extensive requirements for an aircraft commander, pilot, navigator, or radar operator.

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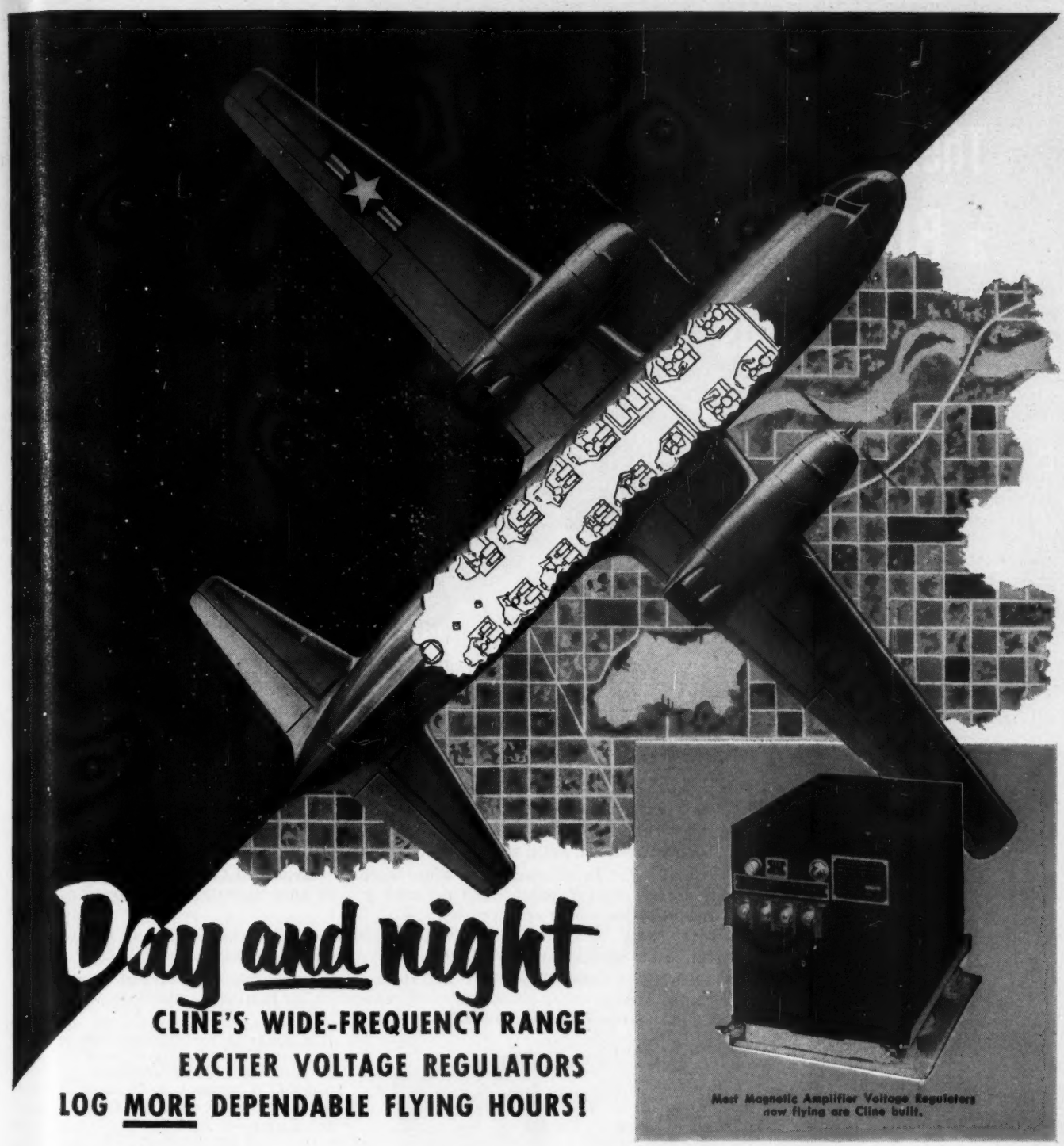

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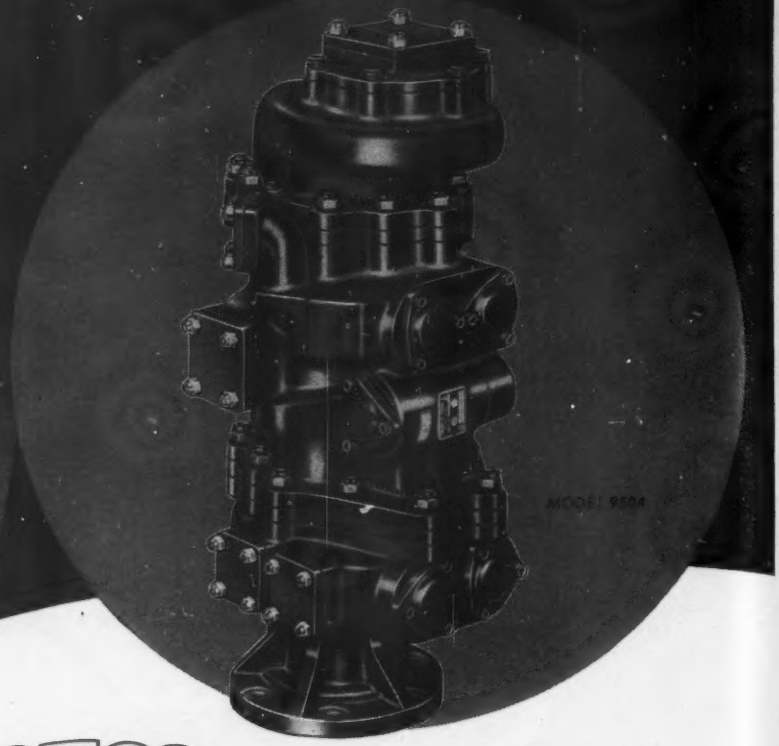

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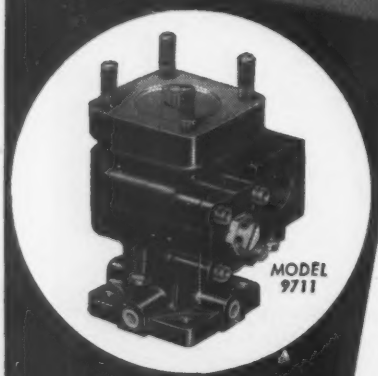

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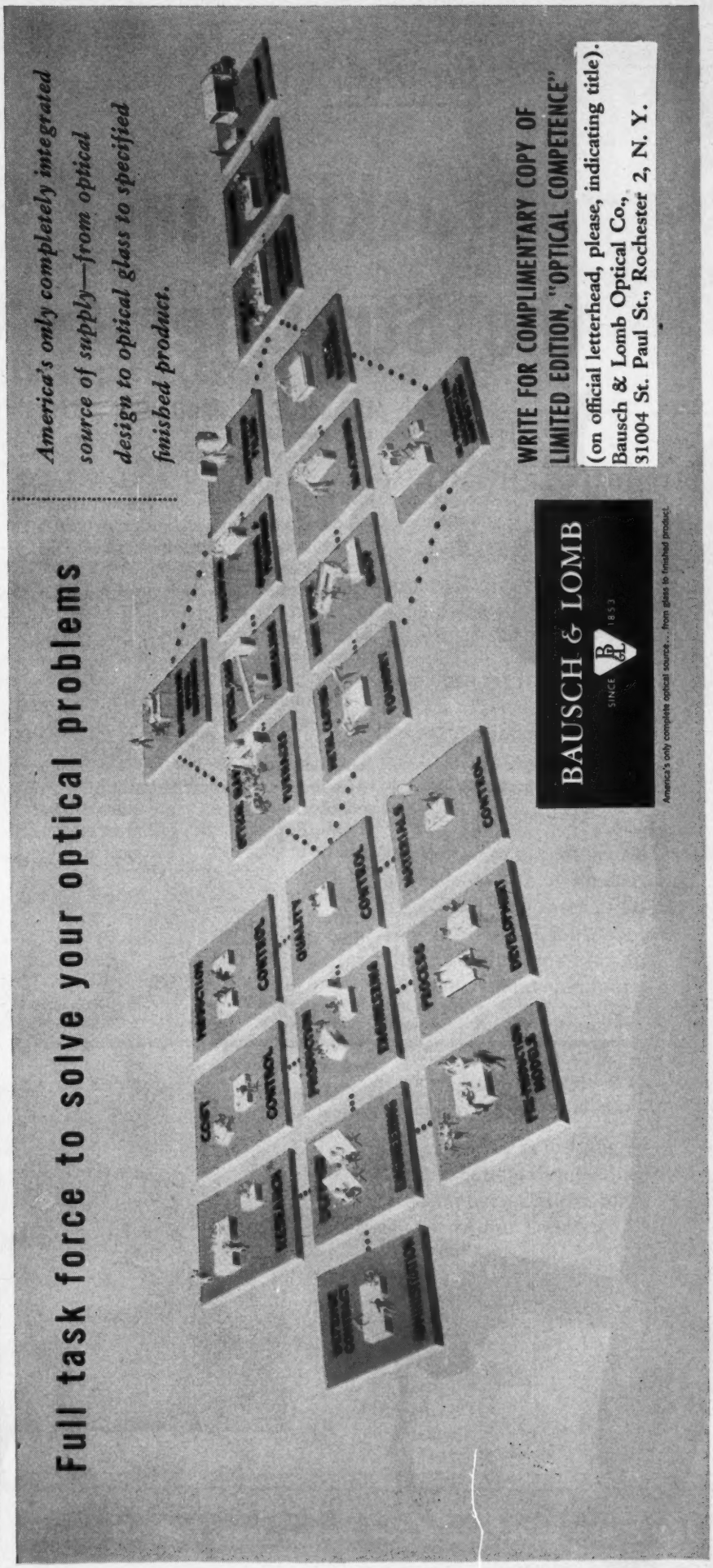
The sturdy aircraft got another test when bad weather forced a B-36 to land in an open plowed field in England. With a few minor repairs, the bomber was towed to the runway and made a normal take-off.

Today, the Peacemaker is programmed for retirement from its role in the SAC fleet. In its place, Boeing's B-52, powered by eight jet engines, with greater speed and increased altitude, is gradually replacing the B-36. The flexibility of this new bomber will continue to give the United States Air Force, and the Strategic Air Command, an air carrier that can keep pace with munition advancements and changes in strategic requirements.

The B-36 has cast a shadow on aggression for nearly a decade now; yet, never has a B-36 dropped a bomb in anger. Its poised might has been deterrent enough to help preserve peace. The history and life of this fabulous airplane have been long and successful. From the drawing board in April of 1941, through its production, tests, modifications, and re-modifications, it has combined talents, forces, and power with America's "striking arm"—the Strategic Air Command—to provide and maintain peace for the United States and the Free World. From its conception to its birth, from its birth through its improvements at present, and from the present into the near future, the B-36 has given, and still gives, a sound basis for the Free World to hope for continued "peace through strength."

—END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SAC *the B-47*

Breaking in the Stratojet

By Col. Michael N. W. McCoy
COMMANDER, 321st BOMB WING, SAC

THIS story begins in January 1950 at Goose Bay, Labrador, where I was SAC project officer for a cold weather air-to-air refueling test.

One Saturday I received a message to report to Omaha the next day. After scheduling an aircraft, I began to wonder what kind of trouble I was in now.

My interview at SAC Headquarters was short and to the point. I was advised that I had been placed on the school list, but I was too old to go to school, and would I rather go to school than be the Commander of the 306th Bombardment Group, which was to be the first B-47 outfit in the Air Force.

I thought at the time that it was a stupid question. However, in the years that followed I often thought my answer was equally stupid, which was, "When do I report?" The reply was, "Day before yesterday."

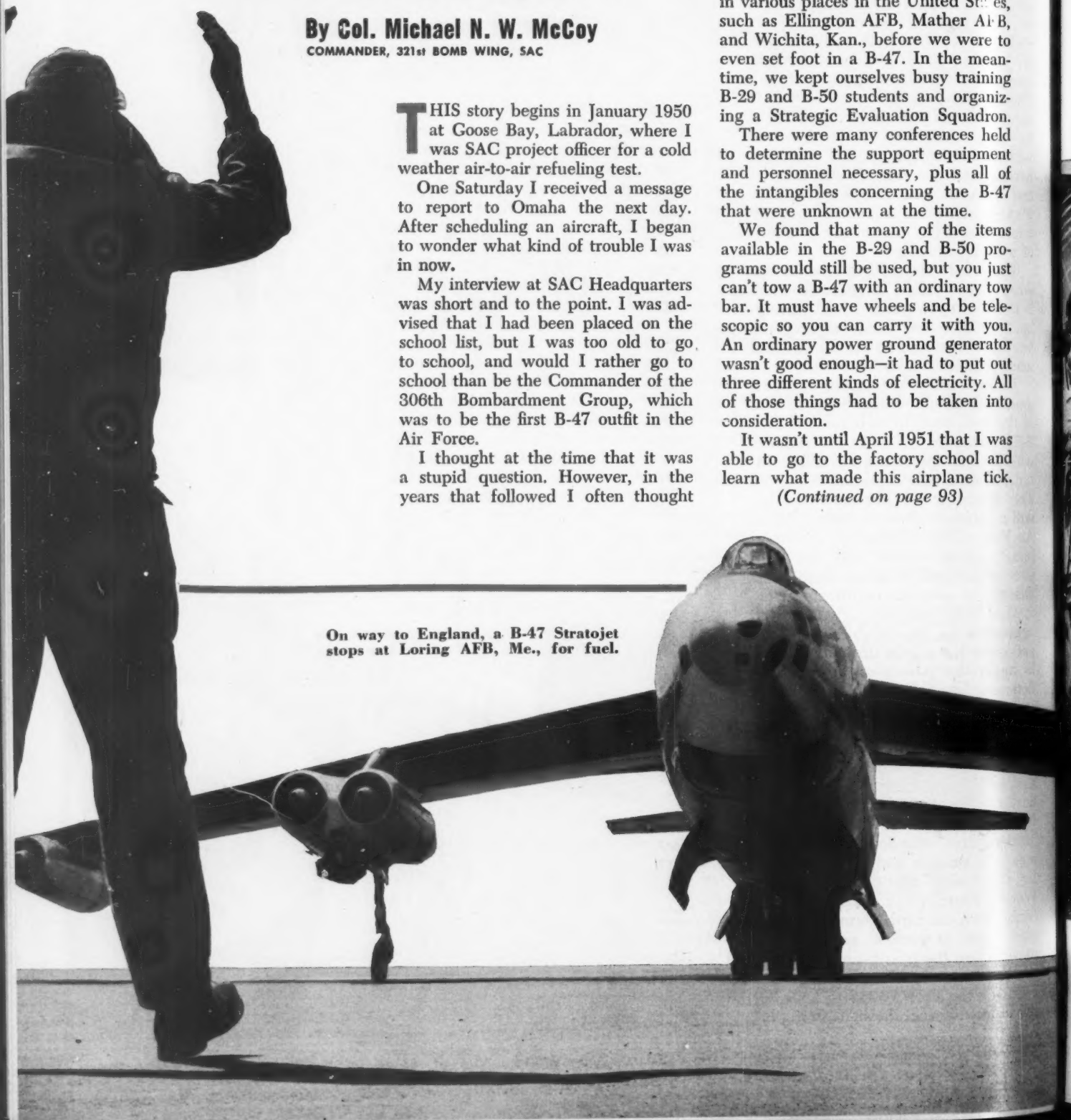
I had been in SAC long enough to know that things move fast, but this was a little faster than I was used to. However, I reported to MacDill Air Force Base, near Tampa, Fla., in a few days, fully expecting to see the ramp littered with B-47s. After getting settled and being briefed on the situation, I found that the B-47 program was far from being ready, at least as far as SAC was concerned. We were to face many, many months of ground training, schools of all sorts in various places in the United States, such as Ellington AFB, Mather AFB, and Wichita, Kan., before we were to even set foot in a B-47. In the meantime, we kept ourselves busy training B-29 and B-50 students and organizing a Strategic Evaluation Squadron.

There were many conferences held to determine the support equipment and personnel necessary, plus all of the intangibles concerning the B-47 that were unknown at the time.

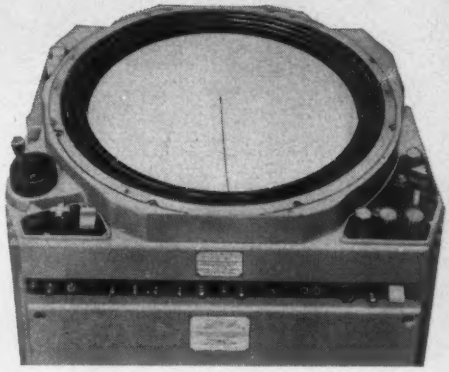
We found that many of the items available in the B-29 and B-50 programs could still be used, but you just can't tow a B-47 with an ordinary tow bar. It must have wheels and be telescopic so you can carry it with you. An ordinary power ground generator wasn't good enough—it had to put out three different kinds of electricity. All of those things had to be taken into consideration.

It wasn't until April 1951 that I was able to go to the factory school and learn what made this airplane tick.

(Continued on page 93)



On way to England, a B-47 Stratojet stops at Loring AFB, Me., for fuel.



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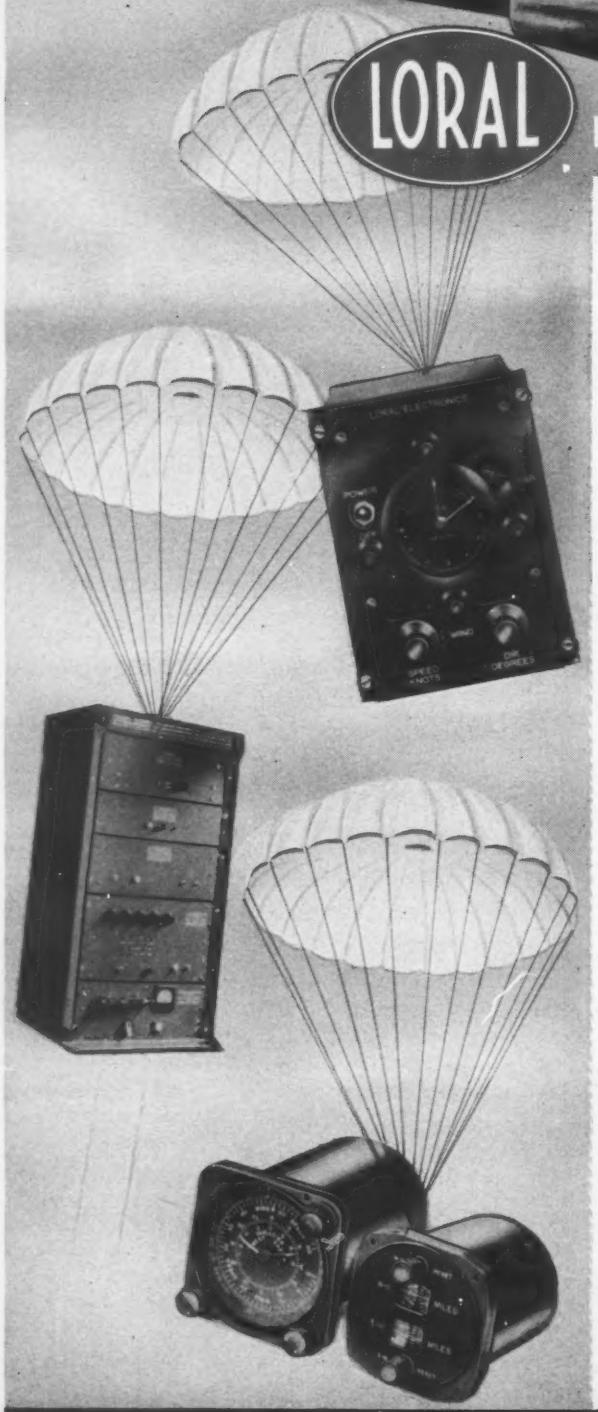

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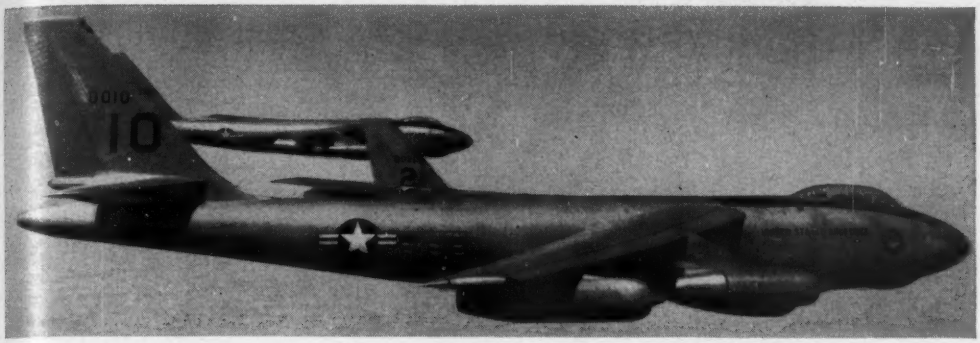

SAC B-47s. A plane like these holds jet distance record of 21,163 miles, set in November '54. The plane, refueled in flight, stayed aloft 47 hours, 35 minutes.

While there I discovered that SAC had a good chance of receiving its first B-47 in a few months.

SAC Headquarters gave me a priority on personnel and supplies. I started out to recruit the best talent I could find. I called on each of SAC's numbered Air Force Headquarters. At Headquarters Fifteenth Air Force, March AFB, Calif., I struck pay dirt. It seems as though all the pilots who had been trained to be radar operators, navigators, and bombardiers—we called them the "four-headed monsters"—had been graduated at Mather AFB and for some strange reason had been unable to get out of California.

I was able to pick up about thirty of the most experienced pilots in SAC, and to this day I dodge Gen. "Rosie" O'Donnell when I see him coming, because he thinks I'm an outright thief.

At the same time, Training Command was attempting to start a school at Wichita and was training instructors. We were fortunate enough to get myself and Col. Don Hillman, my deputy, and five other pilots into the transition check-out phase, which was much like the blind leading the blind. Nobody knew too much about the aircraft in those days.

We finally got the big word that our first plane would be ready to pick up on October 24, 1951. Major Prieve and I went to the Wichita factory and picked up the first SAC B-47, number 008. I don't think there has ever been a ferry flight so well monitored by higher headquarters. No one wanted us to break anything. At MacDill, there was a welcoming committee headed by Maj. Gen. Frank A. Armstrong, Jr., our Division Commander, lined up on the ramp ready to greet the new aircraft. We landed without incident and turned off the end of the runway, shutting down the four outboard engines just like the book said.

In those days the General Electric J-47-11 engines had the habit of continuing to smoke after being shut down. The young lad driving the "Follow Me" jeep tried to do something about the smoking engine. He jumped out of his vehicle, grabbed the fire extinguisher and sprayed the engines with foam. We were worried about the damage to the hot engines, so we shut down the other two. Fortunately, the fire extinguisher was almost empty, and no damage was done. The welcoming committee was waiting about a mile away, and some forty minutes later we were greeted as we were towed in. Not a very auspicious beginning.

We had heard a lot about this aircraft from Mr. J. E. Schaefer, a Boeing vice president and manager of the Wichita Division, and Mr. N. D. Showalter, chief engineer at the Wichita Division, who know their flying machines and who are also excellent salesmen. Some things we believed and some we were doubtful about at first. However, we were able to fly this plane for thirteen straight days without any maintenance, which is the sort of performance that melts doubt away. Colonel Hillman and I finally checked out seven instructors, and we proceeded to train the 306th Bomb Wing. We personally checked everybody, both day and night.

There were amusing experiences, and some not so amusing.

We had set up a runway control radio vehicle, in order to better supervise flying, requiring a supervisory officer on the radio vehicle at all times. In case something unusual went wrong this supervisory controller could read it out of the book and advise the pilot. We believe that this procedure prevented at least three accidents and in one case possibly saved three lives.

Our first accident occurred when a student mismanaged his fuel system, and the airplane had six engines flame out on the downwind leg. I was in the runway control vehicle at the time, and was talking to Captain Williamson, the instructor in the back seat. There wasn't much he could do as the fuel controls were in the front seat, but he made an attempt to get it on the runway. While he was on his base leg, I noticed the nose start to rise,

COL. MICHAEL N. W. McCOY

Colonel McCoy was born October 9, 1905, at Orleans, Ind. After serving with the RCAF in Canada, he was commissioned in the AAF in 1942. During WW II he served as a B-29 group commander at Maxwell AFB, Ala., later as operations officer of the 315th Bomb Wing. He has served as CO of the 306th Bomb Wing and Commander of Pinecastle AFB.

and told him to land straight ahead. Whether he heard me or not, his judgment told him he wasn't going to make it. He did roll out and landed straight ahead—in five feet of water. Everyone got out of the aircraft safely.

Another incident occurred with this same instructor when he was first getting started. He had been sent to the factory to ferry an aircraft. On the way he had shut down number five engine. When he came in for a landing there was a considerable crosswind, which kept him busy. To top it all off, when he pulled the throttles back he missed number six throttle and found himself going down the runway with his number six engine at eighty percent power and a crosswind that didn't help. Capt. J. D. Brashear was in the Radio Control Vehicle and immediately diagnosed the trouble. Brashear called: "Cut number six, Willie." And Willie did—just in time to keep from going off the end of the runway. Experiences like this kept life interesting in those days.

We experimented with the B-47 by scheduling cross-country missions, while training crews, to find out some of the problems we would encounter in bad weather and turbulence.

I remember one night particularly. I was checking out Lt. Col. Benny Klose, and his operations officer, Lt.

(Continued on page 95)

Born in a roar of thunder

Over 25 different models of the Range Servo (all tailored to meet the specific requirements of a particular aircraft) have, to date, been assembled from a few basic units. In every case the amplification, power source, and modulation stages are the same components.

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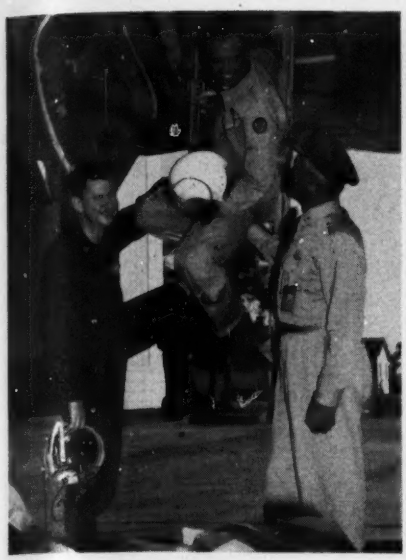

Maj. Gen. Frank Armstrong greets the arrival of first B-47 at MacDill AFB.

Col. Charles Joyce, when we hit a particularly rough thunderstorm. Both students were in the advanced stage of training, and I was riding in the nose. We hit this thunderhead at night and the plane began to buffet. I could hear both pilots on the interphone trying to decide whether we were buffeting from a stall or high-speed buffet. I was having a hard time staying in my seat, so I called back and said: "One of you get out of the seat, I am going to get in one of the pilot's seats"—and we all met in the aisle.

Things went along pretty well until July 1952. By this time we had received our observers and they were flying with their crews. Then, on July 2, 1952, we began to get the grim taste of trouble.

One of our squadron commanders, Lt. Col. Howard Weeks, took off with a crew for a normal training mission and crashed from about 17,000 feet, just south of the base. We never did definitely determine what happened, but we suspected the canopy had come off in flight and injured the two pilots. That same month, about three weeks later, we had another one go in at Marianna, Fla., from 35,000 feet. In each case there were four people on board and in each case four fatalities. After this last accident, all B-47s were grounded until we could determine what caused these two accidents. During the inspection, we found considerable trouble with our fuel cells, and it was decided to replace all fuel cells due to the excessive number of leaks. After this was done, we started flying the aircraft again.

In January 1953, we ran a service test called "Project Sky-Try" on our B-47s. We considered it the best service test ever run on any aircraft in the length of time allowed. The operations order from SAC said: "Beginning 22 January 1953, a simulated combat operation, maximum effort, will be flown each three days for a thirty-day period, utilizing only the fifteen assigned aircraft and crews of the 367th Bomb Squadron." We designed missions that would cover all phases of operation, including single and double air refueling missions, night and day bombing and everything that the B-47 was designed to do. A high priority was assigned to this squadron for personnel and supplies. A big staff, military and civilian, was set up to monitor the test and keep records on the results.

We scheduled and flew 150 missions during this period without one ground abort, every aircraft taking off as scheduled. We flew 1,300 hours in twenty-two days in this one squadron, and in the meantime, the other two squadrons in the wing continued their normal flying. We turned in stacks of Incident Reports and some necessary Unsatisfactory Reports. We compiled consumption data on supply requirements and maintenance hours versus flying hours.

For many months, we had been

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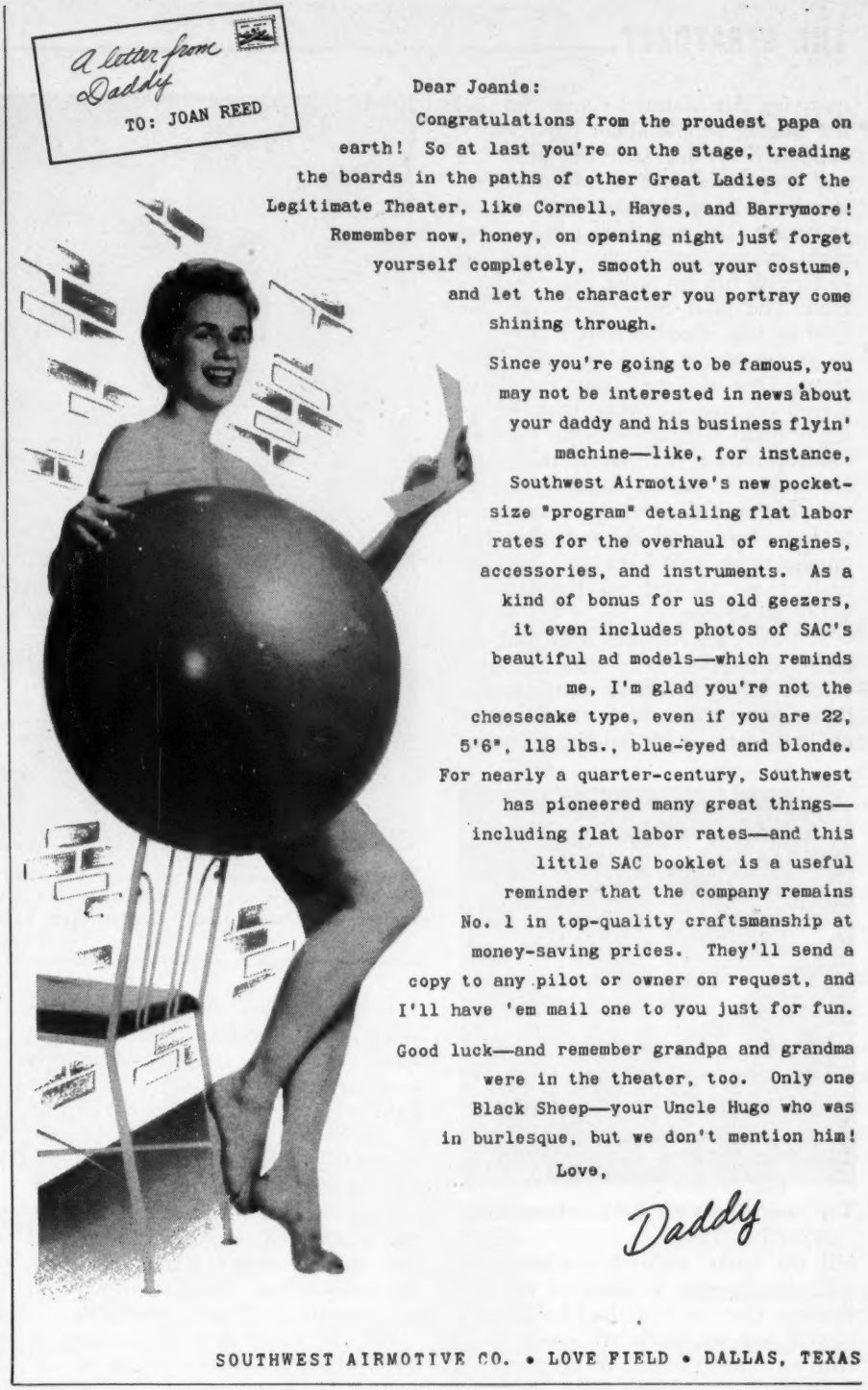
a letter from Daddy
TO: JOAN REED
Dear Joanie:
Congratulations from the proudest papa on earth! So at last you're on the stage, treading the boards in the paths of other Great Ladies of the Legitimate Theater, like Cornell, Hayes, and Barrymore! Remember now, honey, on opening night just forget yourself completely, smooth out your costume, and let the character you portray come shining through.
Since you're going to be famous, you may not be interested in news about your daddy and his business flyin' machine—like, for instance, Southwest Airmotive's new pocket-size "program" detailing flat labor rates for the overhaul of engines, accessories, and instruments. As a kind of bonus for us old geezers, it even includes photos of SAC's beautiful ad models—which reminds me, I'm glad you're not the cheesecake type, even if you are 22, 5'6", 118 lbs., blue-eyed and blonde. For nearly a quarter-century, Southwest has pioneered many great things—including flat labor rates—and this little SAC booklet is a useful reminder that the company remains No. 1 in top-quality craftsmanship at money-saving prices. They'll send a copy to any pilot or owner on request, and I'll have 'em mail one to you just for fun.
Good luck—and remember grandpa and grandma were in the theater, too. Only one Black Sheep—your Uncle Hugo who was in burlesque, but we don't mention him!
Love,
Daddy
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querying Air Materiel Command and the Boeing people about what would happen if we had our tip tanks full and they failed first to feed and then to release. They just hadn't got around to testing this, and during one of our night missions we finally had an aircraft with full tip tanks that wouldn't feed. The pilot came back over the field to talk about it and I told him to go out to the salvo area and drop them. One dropped and the other stayed on, and he found himself facing a night landing with no tank on one side and a full one on the other. He made a skillful landing, which was uneventful until he was down to forty knots and the outrigger tire on the heavy side blew out. The aircraft came to rest on the runway without damage.

It wasn't ten minutes later that another aircraft called in with the same trouble. He received the same instructions, but neither tank would come off, and he made his landing with two full tip tanks without incident and with no damage. I informed the authorities that the tests had been completed and we knew we could land with any configuration of tip tanks.

Top view shows off B-47's clean lines.

Over-all, the things we learned in "Project Sky-Try" advanced our B-47 know-how considerably.

The next event worthy of note was when we took two B-47s to England in April 1953. This was the first time the Stratojet had been overseas, and it created considerable interest in the United Kingdom. Both aircraft, one piloted by myself and one by Lieutenant Colonel Klose, broke the existing transatlantic speed record.

We wanted to survey the European area for our forthcoming wing rotation, and discovered many things that would have to be improved or changed to accommodate the B-47, the most outstanding being radio aids.

Pre-take-off inspection of B-47 crew at MacDill, Feb. '53. From left, Colonel McCoy; Brig. Gen. Henry Mooney, then 6th Air Division CO; Maj. James Gallagher of "Lucky Lady" fame; Maj. Lloyd Fields; and Capt. C. M. Leffingwell.

For example, we learned right away that the low-frequency type homer or range station was clearly inadequate. I was homing in on the Fairford low frequency station and let down through an overcast. I broke out at about 2,000 feet and saw a beautiful runway appear straight ahead. I considered the letdown a success, and proceeded to land. However, I was on the wrong field, some nine miles beyond my destination. My station passage had been unreliable.

We also found that the runways in the United Kingdom had to be repaired, due to roughness.

Upon our return to MacDill from England, speed records again went tumbling. Everywhere you went in those days, you almost automatically set new speed marks.

We began to prepare the wing for rotation to the United Kingdom.

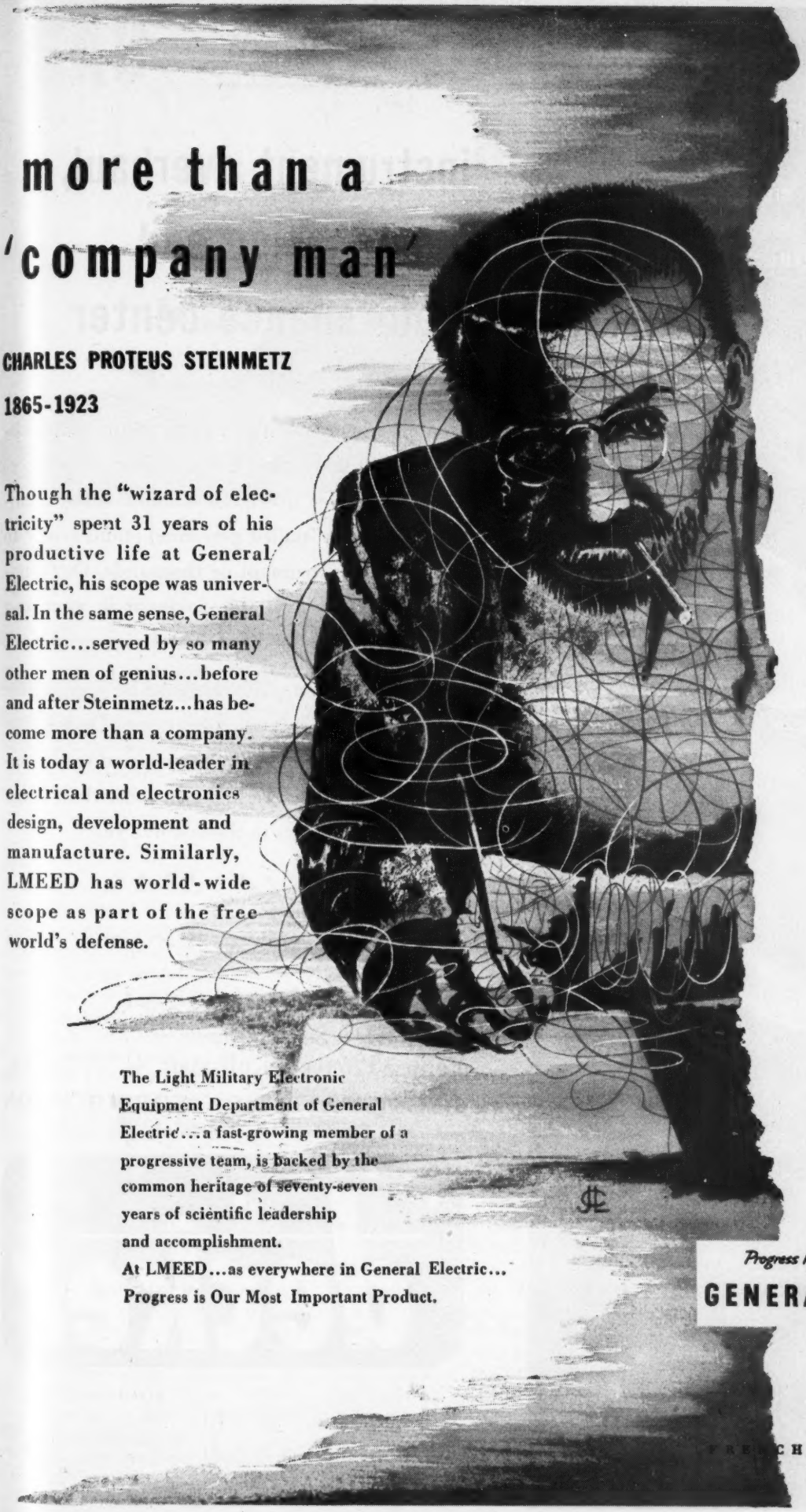
This would be the first of many B-47 wing rotations and it was being watched with keen interest by higher authorities. It turned out to be the finest rotation of any wing in SAC up to that time. It went off with the least amount of trouble and the least amount of time, and clearly demonstrated to the top air echelons that SAC had something really hot.

Although our British base was not completed, we were able to operate with good efficiency for the full ninety days of our programmed rotation. But success never comes cost-free—it was while on this foreign duty that we had our third fatal accident. The aircraft had been sent to another base for a training exercise and the pilot stalled out of a steep turn to the final approach, and went in.

Our ninety-day rotation matured the wing into a well-knit outfit. The refueling squadron, tactical squadrons, and maintenance squadrons were still speaking to each other and were ready to go any place any time. From then on, it was a matter of refining our training, perfecting our bombing, air refueling, navigation, and all the things that go with continually being ready.

We had nicknamed the B-47 "Droopy" because it looked like a wet hen sitting on the ramp. We hear a lot about push-button warfare, but the push button that will push "Droopy" out of the picture is a long way off.

This is only the first installment of the SAC B-47 story. The story is still being written in the skies all over the world.—END



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SAC *the B-52*

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A Jet Age innovation, the crosswind landing gear, is standard equipment on B-52s. Pilots agree that it's a big help.

By Brig. Gen. William E. Eubank, Jr.

COMMANDER, 93D HEAVY BOMB WING, SAC

THE BASE is Castle Air Force Base, Calif., the wing is the 93d Bombardment Wing, and the airplane is the big one, the Boeing B-52 Stratofortress. These are the three elements that go to make up the first combat-ready B-52 unit in SAC. Let me tell you about all three.

Although the Castle story may not be exactly typical, it is certainly symbolic of the rapid growth and expansion of SAC's combat potential. It is the story of a combat wing which in mid-1949 was a typical B-29 unit. In 1950 it had become a powerful B-50 outfit with many times the striking power it had possessed a year before. From 1950 until 1954 it was one of several veteran B-50 combat wings.

In 1954 the 93d Bomb Wing joined the rapidly growing B-47 medium bomber force, with striking power, flexibility, and versatility many times greater than it ever possessed before.

During the twenty months that the wing operated B-47s (June 1954 to January 1956) it flew 24,439 hours without an accident.

In mid-1955 the wing became the first B-52 heavy bombardment unit in the Strategic Air Command.

Thus, in six years, from mid-1949 to mid-1955, the 93d Bombardment Wing had developed from the B-29, with its limited striking power and potential, to the most deadly nuclear striking weapon known in the world today. Throughout this six-year period of transition and growth from one stage to another in the Strategic Air Command plan, the 93d was maintained as a combat-ready unit, prepared at all times to carry out a war mission if directed.

Although it may seem elementary, the first question to be answered is "Where is Castle AFB anyway?"

Believe it or not, that's the question most frequently asked. Castle AFB is near Merced, Calif., in the middle of the San Joaquin Valley. Translated into Air Force language, it is about two-thirds of the way from March Air Force Base to Hamilton Air Force Base—just far enough from San Francisco that the wives can't go shopping every week—just every other week.

The base is named for Brig. Gen. Frederick W. Castle, whom many Eighth Air Force veterans will remember as a heroic combat division commander who was awarded the Congressional Medal of Honor posthumously for valor in action over Germany in World War II. Merced Army Air Field, as it was known in World War II, trained 13,000 cadets in BT-13 aircraft from 1941-1945.

Castle is a single-wing base of the Fifteenth Air Force. Besides being the home of the 93d Bombardment Wing, it also houses the 2d Strategic Support Squadron and the 4017th Combat Crew Training Squadron. This latter squadron, an integral part of the 93d Wing, trains all combat crews for SAC B-52 wings.

As SAC began picking up the pieces of what was left after the World War II demobilization, the 93d Bomb Group, as it was then called, was assigned to Castle in May 1947. It was equipped with B-29 aircraft and crews, and comparatively speaking, was considered one of the strongest of the Strategic Air Command combat organizations of that time.

In January 1951 the Group was designated the 93d Bombardment Wing in the new terminology of the

(Continued on following page)

One of the first B-52 Stratofortresses, the AF's largest and fastest heavy jet bombers, completely dwarfs the Boeing B-17 "heavy" bomber of World War II. Work began on the B-52 early in 1946, and the plane first flew in April '52.

Strategic Air Command organizational plan. From 1947 until the present, the 93d has been led by some of the most famous Strategic Air Command officers, among them Maj. Gen. Robert H. Terrill, Brig. Gen. David Wade, and Brig. Gen. Richard H. Carmichael.

Several years ago, when the B-52 program was still in the planning stages at higher levels, it was decided to convert the 93d into SAC's first B-52 wing. At the same time it was decided that the Wing would train all crews for succeeding B-52 combat wings.

To accomplish this it was planned to organize the 4017th Combat Crew Training Squadron, and attach it to the 93d Bombardment Wing for this purpose.

We occasionally hear the question: "Why hasn't this training responsibility been assigned to the Air Training Command, as it was with the B-47 program?" Here is the answer—to make B-52 aircraft available within Strategic Air Command at the earliest possible date it was advisable for the command to handle the training for its own crews.

Thus, the total number of aircraft available within SAC for combat purposes includes those B-52s used for crew training.

In other words, it was not necessary to decrease the SAC inventory of combat aircraft to support the training function. Many Strategic Air Command personnel will remember that this same procedure was used in the B-36 training program at Carswell AFB, Tex., using a unit also designated 4017th CCTS.

The 4017th CCTS is an Operations and Training Squadron only, and has no unit aircraft. The aircraft belong to the three bombardment squadrons of the 93d, and are maintained by these units. Training sorties are furnished to the 4017th CCTS to fulfill the training requirements of that unit.

Extensive construction work to support B-52 operations began at Castle in March 1954, and all major construction has been completed. To those who knew Castle AFB in World War II, the operating portion such as the ramp, taxiways, and runways are no longer distinguishable. They've been swallowed up in one or another of the several modernization programs.

Even to those who may have known Castle in the B-29 and B-50 days, many of the old features are hardly recognizable. The main runway has been strengthened and considerably lengthened as well as widened. It was also necessary to strengthen and widen the taxiways and the warm-up aprons at each end of this runway.

The entire main parking ramp has been completely overlaid with sixteen inches of concrete. And there are many new buildings, such as the king-size maintenance hangar, base operations, technical training building, crash station, wing headquarters, new squadron engineering buildings, and the aircraft and engine buildings.

At present the only major construction still in progress in the operating area is the project for post-flight and periodic inspection docks. These docks simplify the maintenance problem to a remarkable degree, in that the aircraft can be nosed into the dock itself and all major components and accessories are completely available for maintenance purposes.

A remarkable fact is that at no time has construction handicapped day-to-day operations to the extent that the conversion program slowed down.

The conversion of the 93d Bomb Wing into the first combat-ready B-52 wing actually involved two conversion programs.

The 93d began converting from B-50s into B-47s in March 1954, and while the B-47 switch was still in progress wing planning agencies were paving the way for the next conversion to the B-52.

The 93d became combat-ready in B-47s in record time, in the fall of 1954. Many projects relating directly to the B-52 were already in progress at that time, and in June 1955 the aircraft began to arrive at Castle. By then the 4017th CCTS was ready to begin retraining the 93d's crews.

BRIG. GEN. W. E. EUBANK, JR.

Born in Welch, W. Va., in 1912, General Eubank attended VPI before entering cadet training in 1936. As commander of the 91st Bomb Squadron, he was evacuated by sub from Corregidor when the Philippines fell in WW II, later helped form the 10th AF. He joined SAC in 1948, commanding the 2d Bomb Group before assuming his present job in 1953.

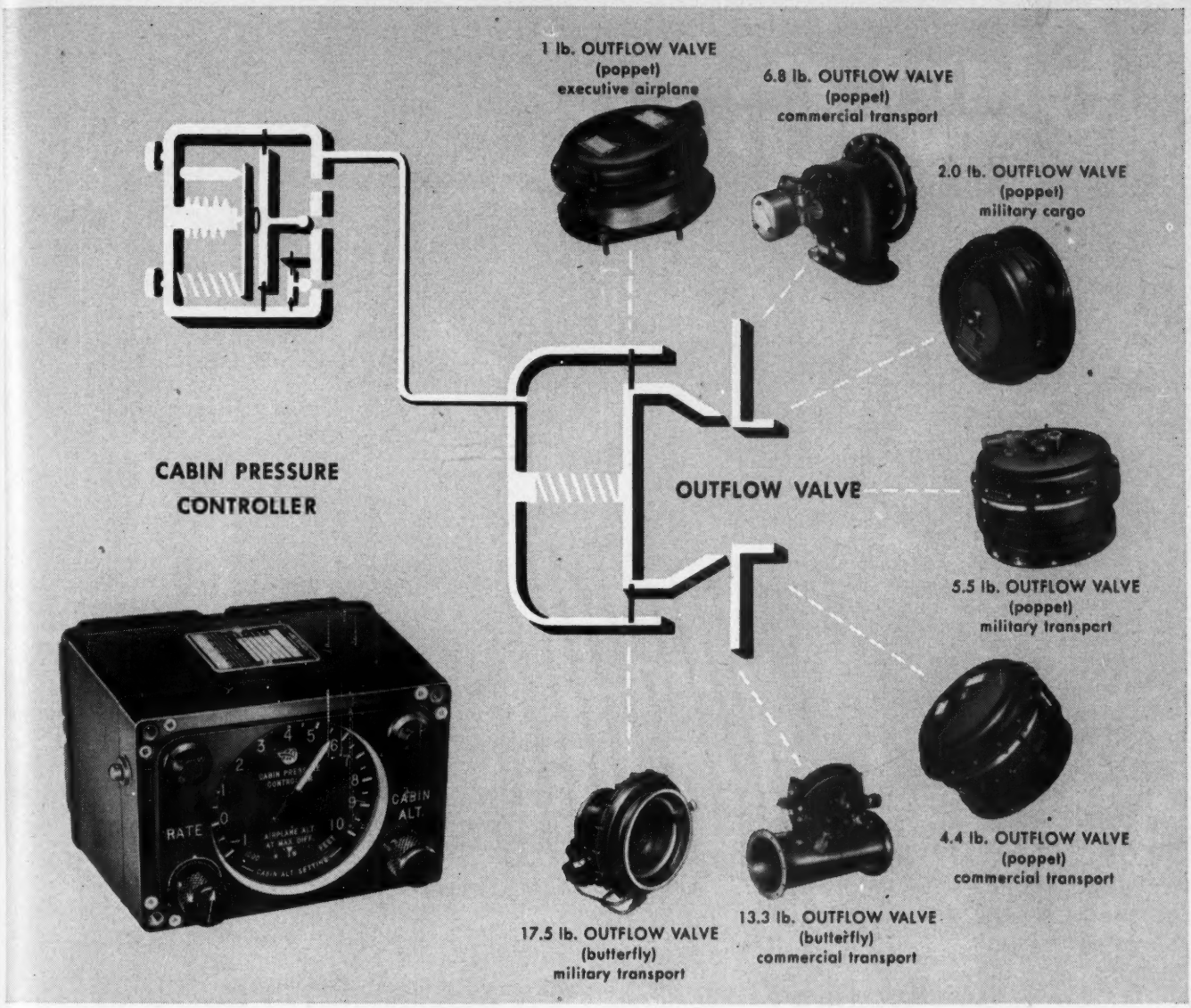
Instructor crew personnel of the 4017th CCTS had received their B-52 check-out training at Edwards AFB in early 1955 while the Air Force Flight Test Center was conducting Phase VI Evaluation tests on the new bomber. The over-all programming plan included the requirement for 4017th CCTS instructor personnel to receive their preliminary training at Edwards AFB, Calif., and in so doing support the needs of the Flight Test Center for flight personnel to handle testing operations. Wing maintenance personnel, more than 200 in all, also supported the testing phase at Edwards and in the process gained invaluable B-52 maintenance training.

With such background for key flight instructor and maintenance people, the 93d was fully ready for the influx of B-52 aircraft when it began.

Extensive training operations started immediately on the arrival of the first new bomber, and continued on schedule until all 93d combat crews had completed their conversion training.

Today the mission of the 93d is

(Continued on page 103)



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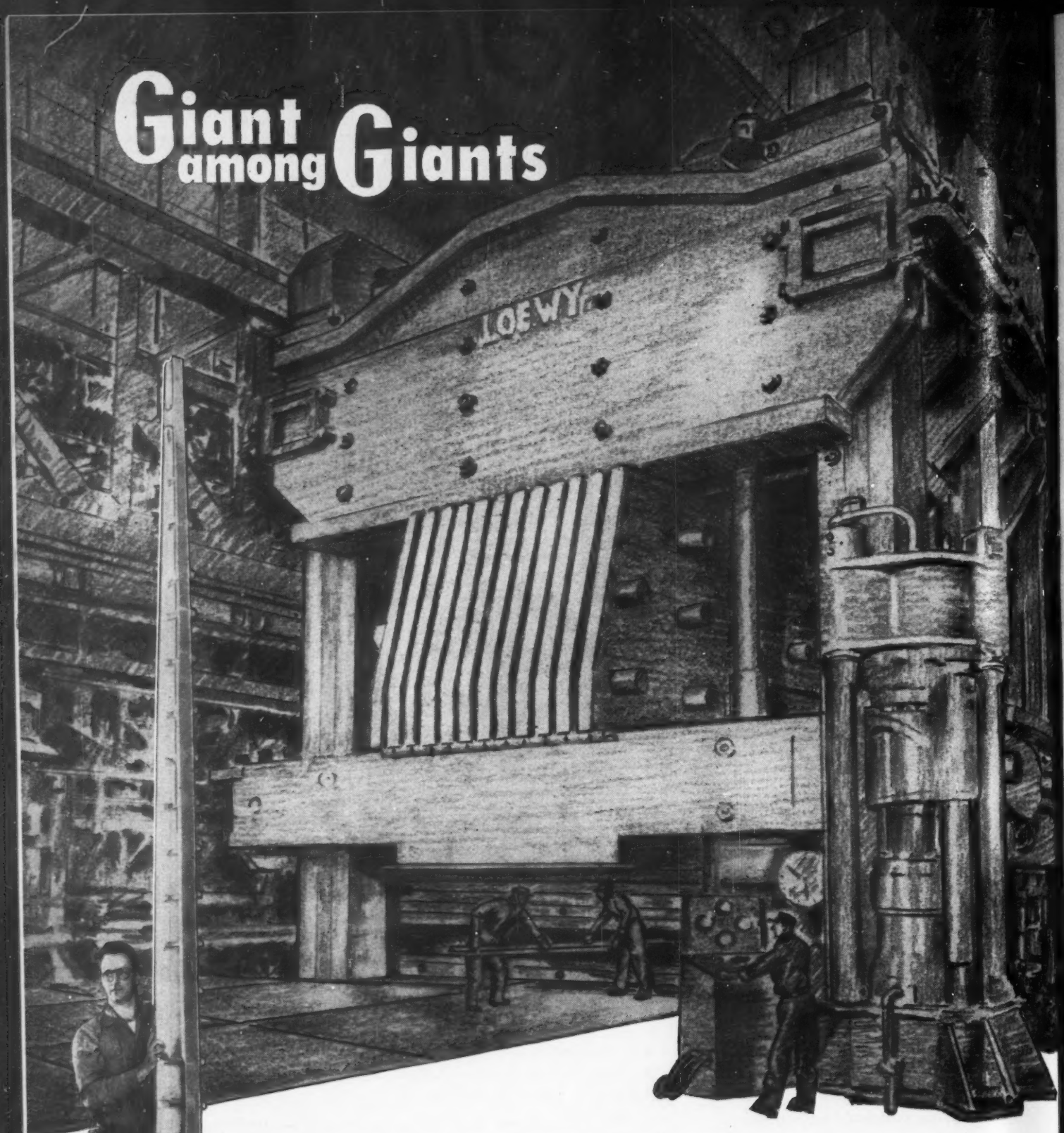

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to maintain a state of combat readiness at all times to handle its mission in the Strategic Air Command emergency war plan, and also to support the 4017th CCTS in the training of combat crews for succeeding B-52 combat wings.

Today the B-52 is no longer a strange sight in the western part of the country. Nor is it unfamiliar to CAA control personnel, or to fighter-interceptor units of the Western Air Defense Force.

The new bomber looks and performs like its older but smaller brother, the B-47, and is just as much a pilot's airplane.

There are many who say the '52 is easier to fly than a B-47, but whether it is or not is inconsequential —both aircraft are equally well liked by SAC pilots.

Naturally the B-52 has better performance than the B-47. It is a later aircraft. Although they look alike, there are many radical differences in the systems of these two planes. Beyond their size, the most obvious difference is the side-by-side pilot configuration in the B-52 as compared to the tandem seating arrangement in the B-47. Experience on the B-47 had indicated that side-by-side seating would improve crew coordination and afford more space.

Another innovation introduced in the B-52 is the use of high-pressure "bleed air" from the engines as a source of power. Extensive studies conducted by Boeing indicated that such a system would be lighter than other systems designed to do the same job. Although many developmental problems were encountered in perfecting this new system, it has been highly successful in the operation of the B-52.

Such standard accessories as engine starters, hydraulic power packs, alternator packs, and the anti-icing system all use—as the primary source of power—high-pressure bleed air from the engines themselves. In the engine-starting system, for example, a small jet-type engine on a cart must be used as a source of high-pressure air to start two of the eight jet engines. Once two of the engines have been started, the bleed air from the internal source can then be used to start the remaining engines.

Whereas the B-47 has all boost-operated control surfaces, the B-52 was designed with manually controlled elevator, rudders, and ailerons to introduce a greater reliability factor. The only power-operated control surfaces are the spoilers on the upper surface of each wing. These work in conjunction with the ailerons to provide greater lateral control.

An historic occasion—Brig. Gen. William E. Eubank, Jr., Commander of the 93d Bombardment Wing at Castle AFB, Calif., is shown (in flight suit) after bringing first B-52 into Castle. His unit was first to get the big bombers.

Instead of the familiar bicycle gear on the B-47, the B-52 has a quadricycle gear which retracts forward and aft into the fuselage, with two outrigger gears retracting into the wings.

Another innovation of the Jet Age is the crosswind steering capability of the B-52. Crosswind positioning of all four main gears is standard equipment on the B-52. It is controlled from a single knob in the cockpit. This feature eliminates all of the critical factors inherent in crosswind landings in all previous types of aircraft. Any experienced pilot will agree that this is a major advance in aircraft design from a flying safety standpoint.

The B-52 carries a crew of six as compared to the B-47's three-man team. This includes two pilots, radar observer, navigator, radioman, and tail gunner. The pilots and the radio operator occupy the upper flight deck compartment; the observers, the lower flight deck; and the gunner rides in "solitary" in the tail.

Eight years were spent in the development of the B-52. The prototype was first flown in April 1952, and by that date more than three million engineering hours had been spent on the design.

The first production model was ready on August 5, 1954, and cost in the neighborhood of $12 million. Today, with the tooling completed and the production line in business, the price of each unit has decreased considerably.

The B-52's eight Pratt & Whitney J-57 engines, the most powerful in mass production today, produce a thrust approaching the equivalent of 100,000 horsepower.

The B-52 gives America the first jet intercontinental capability in history. It can fly a bomb load to targets on the other side of the world and return, at altitudes above 50,000 feet. Its wingspan and length are both greater than the width of a football field, and the top of its rudder towers almost five stories above the ground. It cruises at more than 600 miles per hour, yet its landing speed compares favorably with conventional airplanes of like size.

Forward crew positions are equipped with the latest type of ejection seat. The crew member has only to pull the "go" handle to find himself floating in space.

Under normal conditions the cabin pressure can be maintained at less than 10,000 feet pressure altitude, even at the most extreme heights.

When the first production model of the B-52 left Boeing's Seattle factory, Gen. Nathan F. Twining, the AF Chief of Staff, compared it with the long-rifle of frontier days, which he called "the great weapon of the day" that "kept the savage red men from killing our people."

As General Twining has stated so well, the B-52 is truly the "long-rifle" of our armed forces today. Never before in history has so much striking power been concentrated in one weapon.

The B-52 represents a big investment in money, but if it buys the peace with honor we all desire, it is well worth the cost. The B-52 force is the safest investment I know of today for this nation and the American people.—END

(More on B-52s on next page)

THE BIRTH OF A BOMBER

THE FIRST B-52 wing is now equipped and operational. SAC's combat capability has received a significant boost. The combat crews are happy with it—the airplane has lived up to its advance notices. It's exciting to see this powerful and beautiful, 200-ton weapon take the air. But it was a long time getting here.

The general requirements for an intercontinental bomber were established in 1941. The Convair B-36 and Northrop B-35 Flying Wing were developed from these requirements. As defensive techniques improved, it became evident that an intercontinental bomber must have more range, speed, and altitude performance than either the B-36 or B-35 offered. In January 1946, the Air Force released a new set of heavy bomber requirements and invited the aircraft industry to submit proposals. There were two items of particular significance at that time. First, the need for higher performance forced these new standards before either the B-36 or B-35 had flown. Second, the new performance standards appeared possible because of enthusiastic reports on turboprop engine developments.

In June 1946, Boeing was awarded a development contract to include a full-scale mock p. The competition airplane of 1946 bore little resemblance to the B-52 of today. It had a conventional wing planform with a span of 221 feet, was to be powered by six Wright T-35 turboprop engines (each rated at 5,500 hp.), had an initial design gross weight of 400,000 pounds, mounted five turrets containing twelve 20-mm. cannons, and had a crew of ten.

Although this design was good enough to win the competition, it fell far short of desired range objectives for a number of reasons—the lack of satisfactory propeller-engine combination, the weight of the armament system, and too large a bomb bay. Numerous configurations were examined during the summer of 1946, but none looked good until a new and more powerful Wright engine was promised. The design was then changed to a smaller, more efficient four-engine airplane, even though additional equipment had been incorporated; the crew had been increased to eleven, and the bomb-carying capability increased considerably. The engines were still too high in specific fuel consumption and the airplane also fell short in the critical area of range.

The Air Force finally decided that the only way to get the needed range was to design a special purpose airplane, its only mission the strategic delivery of a nuclear bomb. This allowed reductions in armament, bomb bay size, and number of crew. It was even planned to drop part of the landing gear after take-off. This was the first design to approach intercontinental range. Late in 1947, the contract called for a new full-scale mockup, plus numerous cockpit mockups with tandem pilot seating chosen.

New strategic requirements demanded that the B-52 be capable of deep penetration into enemy territory. Although its speed was now much faster than that spelled out in the 1946 design requirements, it was still relatively slow. About this time air-to-air refueling made it possible to design an even smaller airplane with substantially higher speeds. A new Boeing contract included the construction of a mockup and two prototype airplanes powered by four T-35-W-3 turbines, each producing 8,900 equivalent shaft horsepower and driving nineteen-foot dual rotation propellers. There was to be a crew of seven with a manned tail turret.

Continued engine-propeller difficulties were brought to light in the summer of 1948. Obviously an extended turboprop development program was necessary before such a design would be practical for strategic operation. Studies were made involving temporary substitution of J-40s.

The B-52 picture was muddled and quite black.

A strike at Boeing had slowed mockup work and completely stopped prototype airplane construction. Prototype engine and propeller deliveries appeared to be at least four years away.

Then on October 21, 1948, Boeing engineers Ed Wells, George Schairer, Maynard Penell, Art Carlsen, and Vaughn Blumenthal arrived at Wright Field to confer on their XB-52 turboprop airplane.

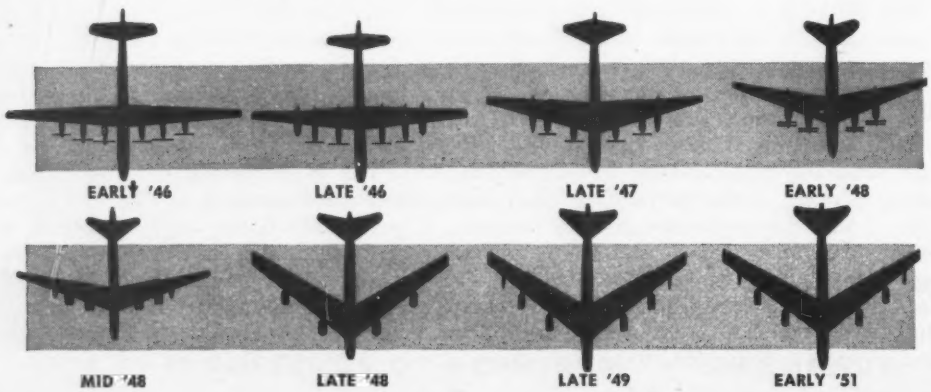
AMC welcomed them with a request for a preliminary study of an entirely new airplane to be powered by a new high pressure-ratio turbojet engine—the XJ-57 proposed by Pratt & Whitney.

The Boeing representatives retired to a Dayton hotel room and went to work.

They worked night and day, Friday, Saturday, and Sunday, October 22-24, 1948. On Monday morning they submitted a thirty-three-page report and a hand-carved model of their proposed configuration. It embodied thirty-five degree wing sweepback, eight XJ-57 P-1 turbojet engines slung in pairs on four pylons under the wing, additional fuel, one tail turret, and elimination of certain equipment called for in prior designs. Within a relatively short time work started on a new mockup and two experimental airplanes. More detailed engineering resulted in an airplane virtually identical to the model that came out of a weekend of hectic work in a Dayton hotel room.

Major changes from that first model have been relatively few. As a result of wind tunnel tests and XB-47

(Continued on page 107)



The evolution of the B-52 is graphically illustrated as it grew on the drawing board from the first straight-wing model with six turboprop engines to the aircraft as it was finally built with a thirty-five degree sweepback and eight J-57 jet engines.

Design, Development, Production

CASE HISTORIES

of Weber Aircraft Corporation

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EJECTION SEATS FOR B-47

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WEBER PRODUCES 1000TH SET OF B-47 EJECTION SEATS

The 1000th set of Weber designed and produced pilot and co-pilot ejection seats for the Boeing 6-jet B-47 medium bomber was delivered to Boeing representatives at a recent ceremony to mark the completion of a significant phase of this production assignment. Production deliveries are being made to Boeing–Wichita, Douglas–Tulsa and Lockheed–Marietta to keep pace with their line requirements.

Seats incorporate lightweight forgings, simple mechanical system

In early 1953, Weber engineers were called upon to design these seats specifically for the B-47, which broke the transcontinental record in 1955 by flying from coast to coast in 3 hours and 24 minutes. In the design, a simple mechanical system is used instead of a complicated hydraulic system. Another Weber innovation is the extensive use of forgings for extra rigidity and light weight. Unusual features of the co-pilot seat are the tilting motion and a swivel ring that permits 180° rotation. This seat structure and the ring transmit all seat loads to the floor with no other structural connection.

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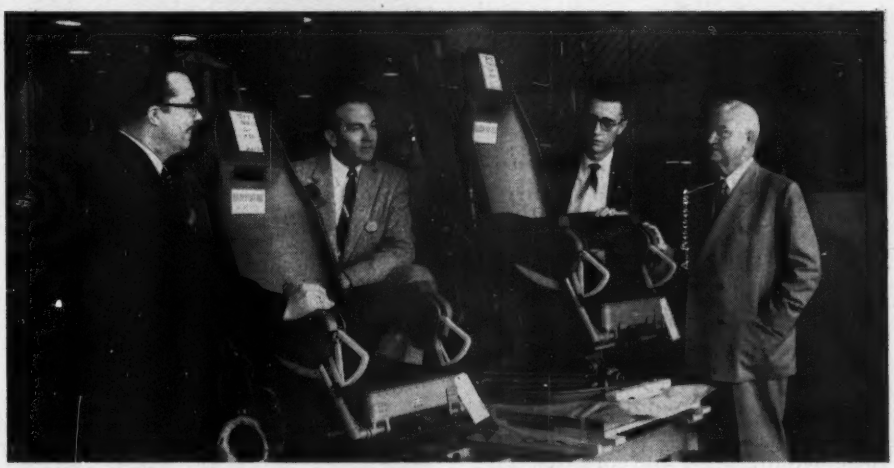
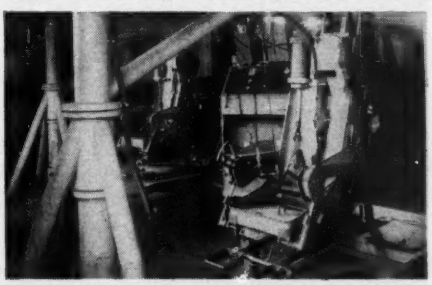
The Boeing B-47, fastest operational bomber in the world, is equipped with lightweight Weber pilot and co-pilot ejection seats.



Executives who met to witness the delivery of the 1000th set of Weber designed and produced B-47 ejection seats: (left to right) O. R. Jordan, Resident Air Force Quality Control Representative; H. F. Kasten, Boeing Quality Control Supervisor, Los Angeles Area; K. B. White, Los Angeles Representative, Boeing, Wichita; and E. K. Meredith, President, Weber Aircraft Corporation.



A set of Weber B-47 seats is mounted in the rigs for typical instrumented tests. Electrical and mechanical functions are thoroughly checked before delivery.

Weber production personnel, responsible for the success of the B-47 ejection seat production program, shown outside the Weber plant at Burbank, California.

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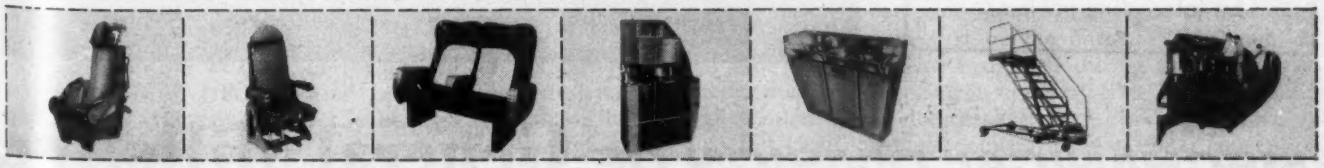

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flight data, the slats were removed from the wing, and spoilers and small ailerons were added. A quadricycle gear gave enough lateral stabilization so that the outrigger need only serve as tip protection gear. In 1951 the Air Force decided to change the cockpit to side-by-side seating. The gross weight was increased to gain more range and take advantage of predicted engine improvements.

Research and preliminary design on the B-52 airplane took thirty-four months. This is longer than would normally be expected. However, the time was well spent because the present configuration represents a far more advanced design than appeared possible earlier.

Experimental design to production go-ahead took twenty-eight months. Extremely satisfactory B-47 flight test reports made this possible since the two airplanes are quite similar in configuration except for size. B-52 production approval was granted before the first flight of a prototype airplane. Another forty months was added before the Air Force accepted the first flight test article.

The XB-52 airplane was moved out of the factory in November 1951. Engine and system ground tests were complete in January of '52. Taxi tests were finished near the middle of March '52, but the airplane had to be returned to the factory for incorporation of equipment not previously available. When the YB-52 left the factory in March 1952 most of the modifications had been completed. The airplane first flew on April 15, 1952.

—Col. Donald E. Hillman

Col. Pat Fleming

The first crash of a B-52 in February took the life of Col. Patrick J. Fleming, one of the most dedicated of SAC's dedicated airmen. His good friend, Beirne Lay, Jr., the well-known screen writer, wrote this tribute to him and sent it to us. Fleming, Lay told us, was an airman who "sought and found complete mastery of his trade. He was a pro. All this is in the record. What will not appear in the record, unless I set it down here, are the events of three Sunday mornings. . . ."—The Editors.

THE BARE facts of the official record in war and peacetime of Col. Pat Fleming, Deputy Commander of the 93d Bombardment Wing, Castle AFB, Calif., who met his death in the first crash of a B-52, add up to a portrait of a dedicated professional perfectionist.

A naval aviator and fighter ace in the Pacific before transferring to the Air Force after World War II, a test pilot, and finally a specialist in the B-47 and the B-52, he couldn't bear the thought that there was any airplane around that he hadn't flown. So he flew them all.

After seven years of marriage, Pat had never found time for his honeymoon with Neville until General LeMay was persuaded to lend him to Paramount Pictures for two weeks as a tech advisor on "Strategic Air Command," while the script was being prepared in 1954. Pat and Neville arrived in balmy Hollywood on a Sunday morning, looking forward to a rest by comparison with Pat's Air Force grind. He needed a rest. He was thin and grey with fatigue. He hadn't had a day's leave since the end of the war. The phone rang. It was Washington. They wanted him to hustle on up to Seattle for consultations on the first air refueling tests with the new Boeing jet tanker. Pat hadn't even unpacked his bag.

He shoved off at once, borrowing a B-26 from nearby March AFB, and flew himself to Seattle, arriving half-frozen and still more tired. The heaters had quit on him and he'd had to remain at high altitude because of stiff headwinds lower down. He switched immediately from his B-26 to a B-47 and took off at dusk to rendezvous with the jet tanker, flying until after midnight and completing twenty-three refueling contacts. Then he climbed back into his B-26, without sleep, and flew back to Los Angeles. He walked into my office at Paramount.

"What are *you* doing here?" I asked. I hadn't expected him back for two or three days.

"It's Monday morning, isn't it?" he said. "I'm supposed to be working for Paramount."

A year later, on a Sunday morning, Pat and Neville pulled into my driveway with their three little girls and the family car piled high with vacation gear. They were on their way to Laguna Beach for two weeks' leave. Two weeks later, I arrived at Castle AFB at the tail end of a fifteen-day tour of active duty in my Reserve assignment with SAC. Pat was the first guy I ran into. It developed that he just couldn't stay away from those B-52s. After a few days at the beach, he cut his vacation short. He'd been flying five nights in a row, checking on the new crews in training. Each sortie meant a seven- or eight-hour mission, beginning with Stations at 0300. I went on one of these missions the next morning with Pat. It was a rugged seven-and-a-half hours at altitude. Once a week would be often enough to suit most pilots just fine. At one point on the flight, I crumpled an empty cigarette package and, seeing no container handy, tossed it on the flight deck. Pat was on the interphone immediately.

"Put it in your knee pocket," he said. "The crew chief on this aircraft's got enough to do." But the rebuke didn't sting. He was so right. And it was typical of him. But what I remember best about that flight was the way Pat was all over that airplane, knowing every man's job cold. Each crew member was a sharp, picked veteran of the B-47 program, but Pat's probing eyes and questions kept them sweating. "What do you do if you lose electrical power?" he'd ask. The man had better know the answer.

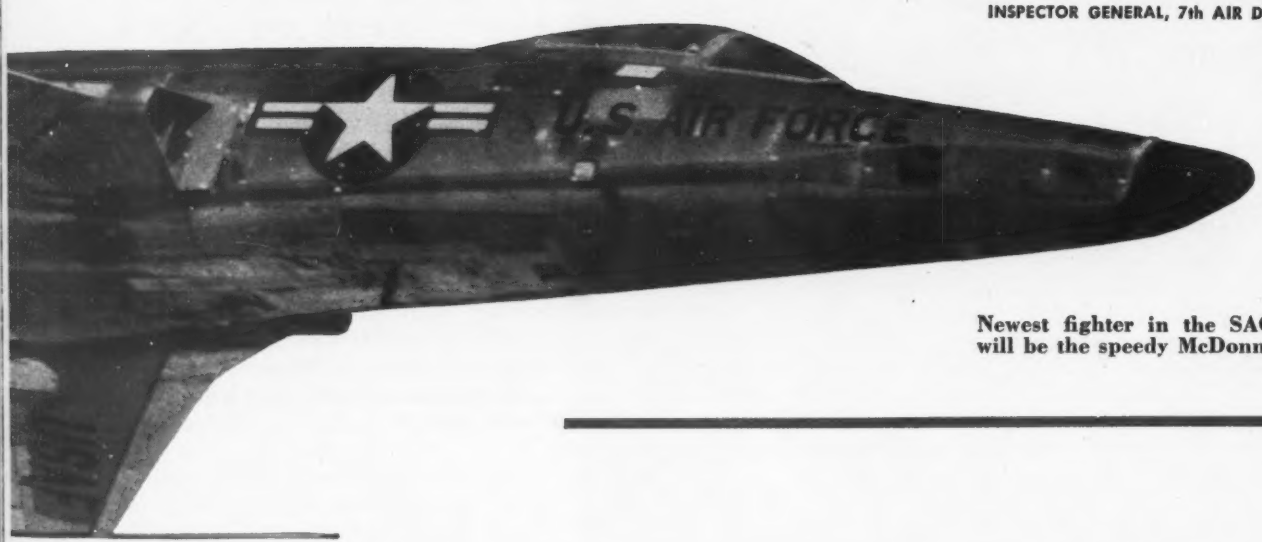
And then there was a Sunday morning in February. Pat had been one of the four listed as missing since the explosion of a B-52. When they found him his 'chute was missing, apparently burned off, after he remained in the cockpit too long, applying emergency procedures, helping the others get out.

My friend on the phone added a tragic footnote. Pat was scheduled to leave in less than two weeks for a desk job at SAC Headquarters as Director of Requirements. He had already compiled hundreds of hours of B-52 pilot time, flying far in excess of the normal requirement of his job. But instead of easing off during those final two weeks, he was squeezing in every possible hour in the air. He wanted, when he reached that desk in Omaha, to speak from the vantage point of his own, inner conception of a real "pro."—End

SAC *fighters*

SAC's Little Fighters and How They Grew

By Col. David C. Schilling
INSPECTOR GENERAL, 7th AIR DIVISION, SAC



Newest fighter in the SAC inventory will be the speedy McDonnell Voodoo.

LOOKING back to 1946, when the Strategic Air Command got all of its fighter support from a few left-over World War II propeller jobs, we fighter pilots feel much like the atomic artillery officers with their memories of 75-mm. pack howitzers carried by mules.

Except for one thing, perhaps, the fighter as an arm of SAC might have gone the way of the pack mule. That factor was the rapid development of fighter-type aircraft which, in ten years, has brought the fighter to its present-day long-range strategic capability and has greatly added to the complexity and importance of its mission as an air weapon.

When SAC was organized in 1946, and given a global responsibility for strategic air operations, our North American F-51 and Republic F-47 fighter planes were assigned the mission for which they had been designed—fighter escort. There was little else they could do, but in succeeding years the mission of SAC's fighter commands has grown in importance with each delivery of a new, improved fighter plane.

These changes began in 1948 with the replacement of our F-51s and F-47s with a long-range propeller-driven fighter, the North American F-82 Twin Mustang and the Lockheed F-80 Shooting Star—SAC's first jet fighter. The F-80, however, was limited in range.

A year later the command's first long-range jet fighter, the Republic F-84E, was delivered. Its range was further extended by the delivery of the G model, which had an aerial refueling capability.

Our fighter wings now are equipped with the sweptback F-84F, which greatly increased performance capabilities while retaining range characteristics of earlier models.

As a direct result of fighter development, the primary mission of strategic fighter wings today is the delivery of nuclear weapons in support of the strategic offensive. Secondary missions of the versatile jet fighters are several, including air defense responsibilities, use of conventional weapons, and an escort function when required.

Fighter wings, equipped with nuclear weapons, are in themselves powerful striking forces which may be strategically used independently of bomber forces or in areas where bomber forces are not committed. Their power is such that it would take more than 10,000 B-17s loaded with conventional weapons to equal the destructive force of a nuclear attack which could be delivered by one SAC fighter.

With the advent of the nuclear weapon, and its later adaptation to fighter use, probably the most important aids to development of fighter capability was the development of the aerial refueling technique.

(Continued on page 111)

TENTH ANNIVERSARY

Strategic Air Command

America's FORCE FOR PEACE

Teamwork and coordination are the keynotes of SAC, its officers and men of every rank—from airmen to commanding Generals. Pilots, co-pilots, observers, crew chiefs . . . technicians, mechanics . . . clerks, administrators, supply men . . . all are carefully chosen, highly trained specialists whose pride in their Command welds them into a tremendous force for peace. They are masters of their jobs. SAC has won the international respect of military experts for its handling of complex global operations under a single highly developed central control.

Curtiss-Wright joins all America in saluting the Strategic Air Command on its Tenth Anniversary as guardian of America and of world freedom.

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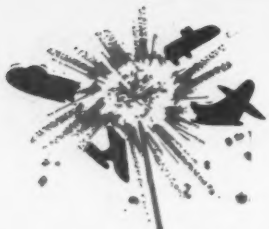

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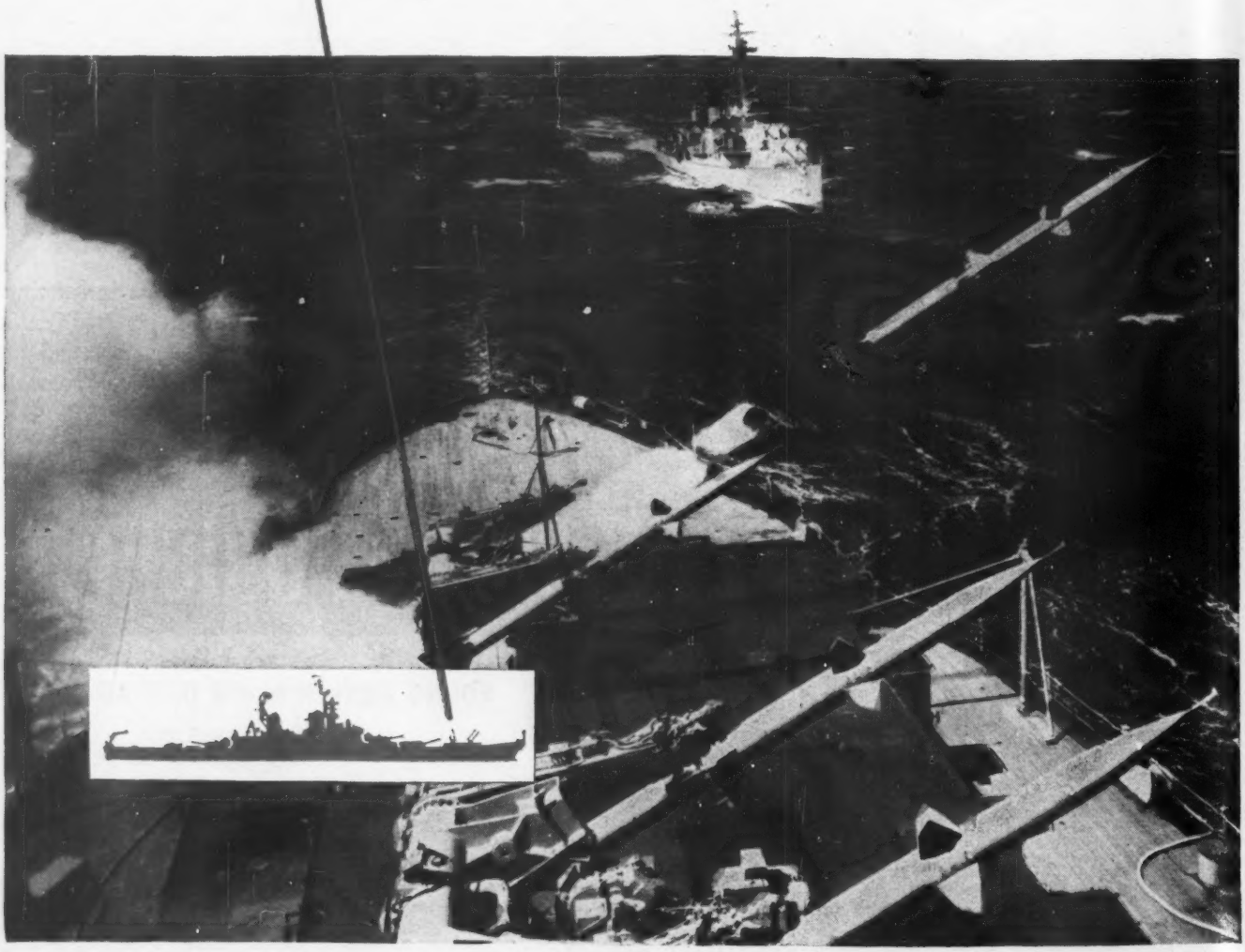

Increased integral range, plus an in-flight refueling capability, gave fighters the mobility they needed to cross oceans in hours rather than days; to deploy from one side of the globe to the other, just as bomber wings deployed.

The importance of the mobility factor can be realized if we remember that in 1946 our 56th Fighter Group—the command's only fighter wing—was equipped with twenty-one worn-out F-47s and ten borrowed F-51s. Yet World War II tactics would have had to be employed if ever an emergency sent these aircraft into action in support of bomber operations. This was a period before jets were integrated in the USAF, and unfortunately it was an era when the United States was awash with "demobilization consciousness."

Two years later, however, the picture had changed. The Czechoslovakia coup, the Berlin blockade, and other Communist moves in Western Europe once more focused attention on America's air arm as the only weapon in the hands of the Free World that could match the strength of the huge Red Army.

Before our jet fighters could effectively support SAC bombers in their global missions, a way had to be found to get them quickly from the ZI to either Europe or the Far East. Otherwise, the advantage of speed would be lost in a lot of overnight stops. The answer, of course, was air refueling, whereby fighters could leave the United States and in twelve hours or less be located on overseas bases in Europe. But before the perfection of air refueling for fighters and the twelve-hour Atlantic flight, a lot of groundwork had to be covered. From 1948 through the Korean war years, SAC pioneered the non-stop ocean hops, which in 1956 have come to be accepted as routine.

The first of these pioneer flights was "Fox Able One," flown in July of 1948 by a flight of our 56th Fighter Group F-80s from Selfridge AFB, Mich., to the US Zone in Germany. This flight was not a non-stop trip, but it had its problems. Although the F-80s were to land at Goose Bay, BW-1, Greenland, Keflavik, Iceland, and Stornoway, Scotland, on the transatlantic hop, earlier surveys had shown that there were no facilities whatsoever east of Bangor, Me., and west of Stornoway, Scotland, for support of jet aircraft.

This severe lack of facilities meant that refueling filter carts along with other parts and equipment had to be carried along, and due to the exigencies of the Berlin Airlift, we were limited to one C-54 and one C-47 for transport. Faced with this airlift shortage, we had to use great care in selection of spare parts, ground power, and ground handling equipment, a job that was accomplished to perfection by Capt. Frank Klibbe.

Execution of "Fox Able One" from Selfridge AFB, Mich., to Furstenfeldbruck, Germany, took twelve days, including a six-day delay at Goose Bay and overnight stops at BW-1, Keflavik, Stornoway, and RAF Station Odham in England.

We remained at Furstenfeldbruck for two weeks of flight training in Germany and then flew back to Selfridge AFB, making the same stops as going over. On the deployment over and back, we had Navy weather surface vessels and B-17 rescue aircraft patrolling our route.

"Fox Able One" was the USAF's first mass overwater deployment of fighter aircraft, and it was strictly a SAC show. The ferry route, along with rescue and communications procedures we established on the flight, are still SOP for other commands deploying jet fighters to Europe and back to the ZI. They are still the guide for the ferrying of jets as replacements for our units in Europe and as unit equipment to the air forces of the NATO countries.

Further use of "Fox Able One" reports and procedures was made by SAC in 1949 when fifteen F-80s were flown to Europe. In 1950, the 27th Strategic Fighter Wing flew 170-odd F-84s over the same route without losing an aircraft.

These deployments across the Atlantic Ocean, although much faster than the old method of transporting fighters by aircraft carrier or disassembled in crates, were still much too slow to fit into SAC's global mobility plans. What we needed was a jet fighter aircraft with air refueling capability.

Republic gave us the F-84 in 1951 and we were in the air refueling business. SAC units started receiving them in September of that year and our 31st Strategic Fighter Wing was among the first units to get them. However, plans for overwater deployments had to be sidetracked because it took us the rest of 1951 and the early part of 1952 to get the "bugs" out of the air refueling system.

While we were working with Republic technical representatives at Turner AFB, Ga., on the F-84G air refueling system, we were extremely fortunate in getting one of the world's foremost authorities on fighter navigation assigned to the wing. The man was Col. Charles F. Blair, USAF Reserve, a captain for Pan American Airways who had flown an F-51 Mustang from Norway to Alaska in 1951, using his new navigation system. [*At the 1952 AFA Convention, Colonel Blair received an AFA Citation of Honor for this flight.—The Editors.*] He found an attentive audience at every one of his lectures in the 31st SFW briefing room.

Charlie had a completely new approach to celestial navigation which employed pre-computed running two-star fixes instead of the old, cumbersome three-star fixes. Using this system, only two new pieces of equipment were necessary—an automatic pilot and a suitable sextant. Lear, Inc., came through with the auto pilot and the Kollsman Instrument Co. with a hand-held version of the periscopic sextant developed by them for the B-47.

COL. DAVID C. SCHILLING

Born in 1915, in Leavenworth, Kansas, Colonel Schilling graduated from Dartmouth College in 1939, received his wings the following year. A WW II ace (33½ enemy planes), he headed an 8th AF fighter group in England. For his contributions in jet fighter air refueling, Colonel Schilling received the coveted Harmon Trophy for 1950 and AFA's Flight Trophy in 1952.

We modified six F-84Gs and accomplished a considerable amount of celestial navigation training during the time we were perfecting the air refueling system. When we had mastered both, we started planning a non-stop flight from Georgia to French Morocco. Our plans were to utilize air refueling over Bermuda, between Bermuda and the Azores, over the Azores and then straight into a SAC base in French Morocco.

About mid-June of 1952 we were ready and approached General LeMay for permission. His reply was that the Strategic Air Command had some plans for long overwater fighter deployments and that he would let us know when he was ready to give us the green light to proceed.

(Continued on following page)

Gen. Hoyt Vandenberg, then AF Chief of Staff, congratulates Col. David C. Schilling, Harmon Trophy winner in 1950 as leader of "Fox Able Four" flight.

Three days later he did.

I was at Maxwell AFB, Ala., attending a special orientation course when my deputy, Col. Dingy Dunham, called saying a message had been received from SAC Headquarters which necessitated my immediate return to Turner. I knew Dingy well enough to know that something "hot" had been received, so I headed south for Albany as soon as I grabbed my toothbrush.

The message flashed to Turner from Omaha was for the 31st Strategic Fighter Wing to execute "Fox Peter One"—the deployment of sixty F-84Gs and all support equipment and personnel from Turner to Misawa, Japan.

Eight days after receiving the initial flash, sixty aircraft, 1,000 men and 380,000 pounds of equipment were on the way—a far cry from our initial "Fox Able One" deployment in 1948.

The "Fox Peter One" route directed by the SAC Operations Order called for a practice refueling hookup over Wink, Tex., and then into Travis AFB, Calif., for final staging before going across the Pacific.

From Travis, we were directed to fly the 2,142 miles to Hickam AFB, Hawaii, utilizing air refueling at a point some 600 nautical miles west of the California coast. For safety, emergency tankers were stationed six hundred miles east of Hawaii. From Hawaii to Japan, we were directed to island-hop by way of Midway, Wake, Eniwetok, Guam, and Iwo Jima into Japan.

It is a matter of history that things got a little more than somewhat fouled up on the practice air refueling leg over Wink, Tex., and this required quick modification of the original plan. We saw the causes of our difficulties, remedied them, and it is also a matter of history that our final plan is now SOP for mass air refueling of fighters throughout SAC and the United States Air Force in general.

In contrast to "Fox Able One," where we had one C-54 and one C-47 as support aircraft, we were given four MATS C-74 support planes which enabled us to carry sufficient spare parts and ground handling equipment, plus enough ground personnel to pre-position this material along our route.

After rounding up all the strays from our Wink, Tex., adventure and getting them safely into Travis, we were ready to start across the Pacific. There are some incidents of the "Fox Peter One" deployment which should be mentioned.

On July 6, the 307th Squadron roared down the long runway at Travis and headed west. Maj. Bob Keen commanded the 307th, but he flew as my deputy that day. The squadron encountered no trouble effecting a rendezvous with our tankers as planned, but I didn't get to Hawaii on that first flight.

The tanker I was assigned to had made the mistake of coming out with an oversize nozzle on the boom. The first attempted contact sheared the pins in the slipway toggles and resulted in a disconnect which prevented the taking on of any fuel. There was no alternative but to do a quick 180 and head back to Travis. Major Keen led the squadron safely into Hickam.

On July 7, the 308th Squadron, commanded by Maj. Jerreld Vivian, took off for Hawaii and I tagged along with them. Again, I had refueling difficulties and did not receive as much fuel as the boom operator said he had delivered. This forced me to tap the emergency tanker east of Hawaii.

Lt. Col. Chuck Lenfest led the 309th Squadron into Hickam on July 8, and the wing had completed the most dangerous leg without a serious incident.

After a day of rest, we were ready to resume our westward flight. We flew to Midway, a distance of 1,141 miles, without incident, allowing a twenty-minute interval between squadrons.

Midway is a reserve for gooney birds, and there were literally thousands of them on the island. This caused us great concern as we feared our jets would "inhale" the birds and damage our engines. When we left Midway on the morning of July 11, we all left safely, but only after clobbering many goonies. High scorer in the wing was Capt. Hank Mierdierck, who fried four or five when he took off. Nobody would come near old Hank when he landed at Wake because he smelled like burned gooney bird meat and feathers.

Our ground personnel really got a workout on Wake Island. Due to limited parking and refueling facilities, we flew out of Midway with a two-hour interval between squadrons. The first squadron landed at Wake, had to refuel and take off before the second squadron could land, and this squadron had to refuel and be in the air before the third squadron could land. From Wake we made a short hop of 536 miles to Eniwetok.

Somewhere between Midway and Wake, pilots of the 307th Squadron experienced a nerve-racking minute. One of the boys lost his main tank boost pump and had a flame-out when he switched to his auxiliary tank. He glided from 32,000 feet down below 20,000 before he got his fire lit and climbed back to join his greatly relieved buddies.

On July 13, we were ready to depart Eniwetok and our JATO take-offs furnished a picturesque scene. Everybody fired their two JATO bot-

(Continued on page 115)

IN THE PALM OF HIS HAND

. . . a complete military transmitting and receiving station weighing about one pound!

The "battle maneuvers" illustrated above disclose a new dimension in military communication, made possible by modern transistor developments.

In his hand the officer holds an RCA Transceiver, a complete radio transmitting and receiving unit—the smallest 2-way FM radio ever built. The entire walkie-talkie is only 6" x 3" x 1⅛" in size, with weight, including battery and all accessories, of about 20 ounces.

The men in the field listen to "battle instructions" over tiny receiver units built inside their helmets.

With a range of about a quarter mile, the RCA Transceiver can be pre-set for any frequency between 45 and 52 mcs. Only two controls are used and no tuning or adjustment is necessary during normal use. The receiver is an all-transistorized superheterodyne and the transmitter comprises two transistors and one tube, both contained in a single unit.

The feather-lightness and miniature size of the transceiver and receiver make it possible, for the first time, to extend communication to the individual level. It is another instance of RCA's constant search for new and better ways of doing things electronically. Demonstration and consultation with RCA field engineers throughout the world are invited. Call or write.

RCA Ultra-Miniature FM Transceiver compared with AN/PRC-10 (Walkie-Talkie)

TYPICAL MILITARY APPLICATIONS

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Medical work (litter bearers to field hospitals) *. . . and hundreds of others.*

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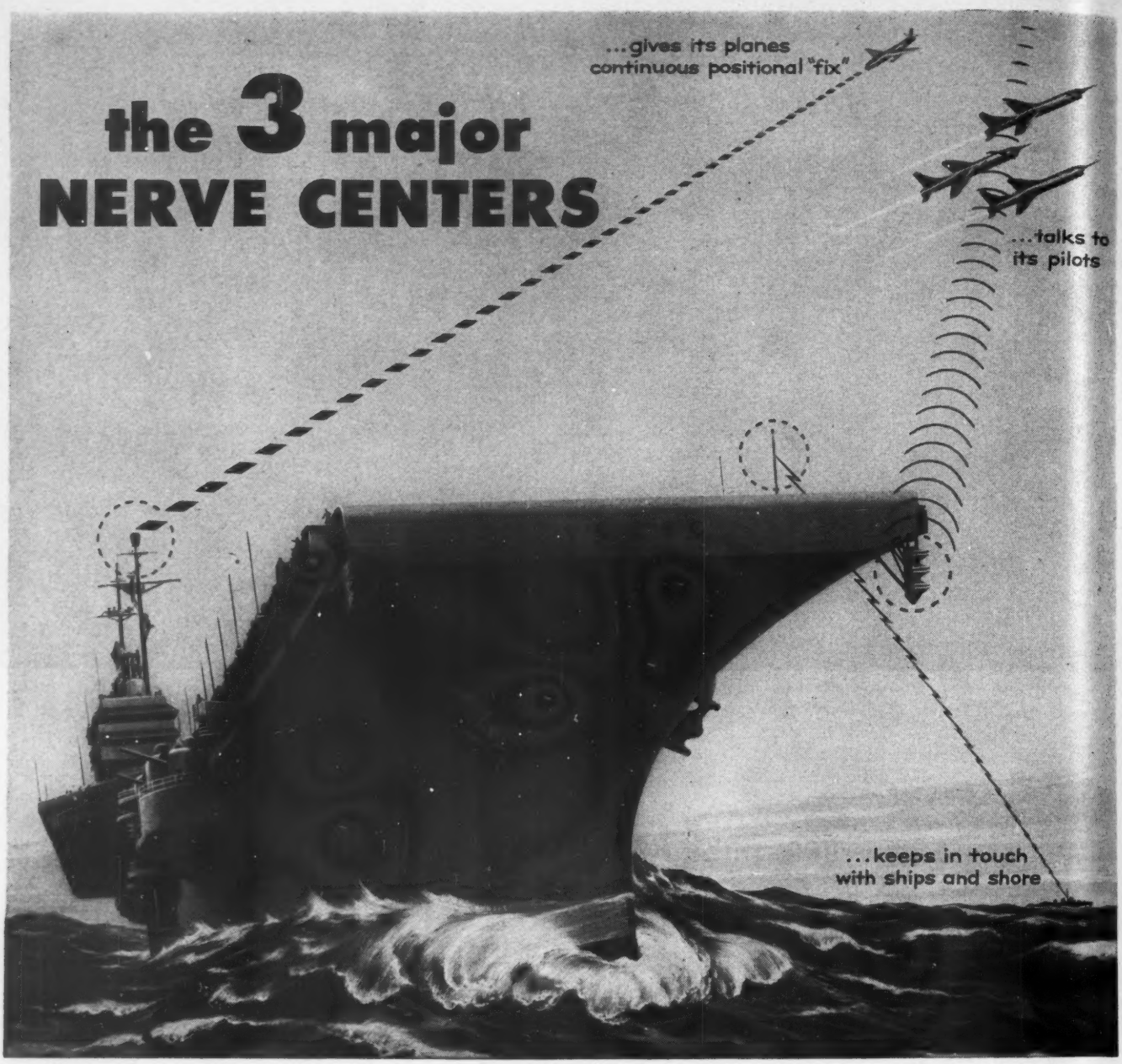

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To guide its planes safely home through darkness, fog, and stormy weather, the FORRESTAL utilizes Tacan . . . revolutionary new system that continually indicates position of moving ship to its fast-flying planes.

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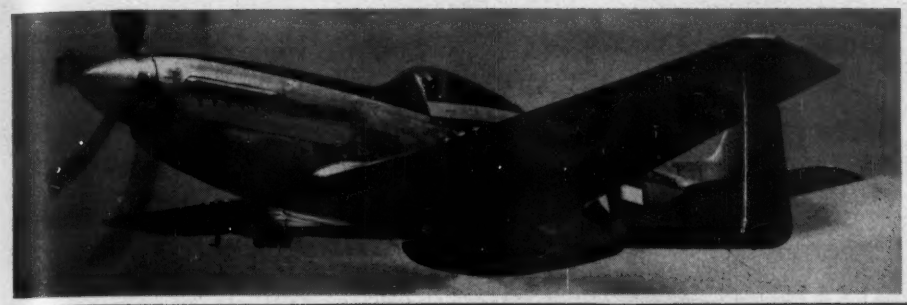
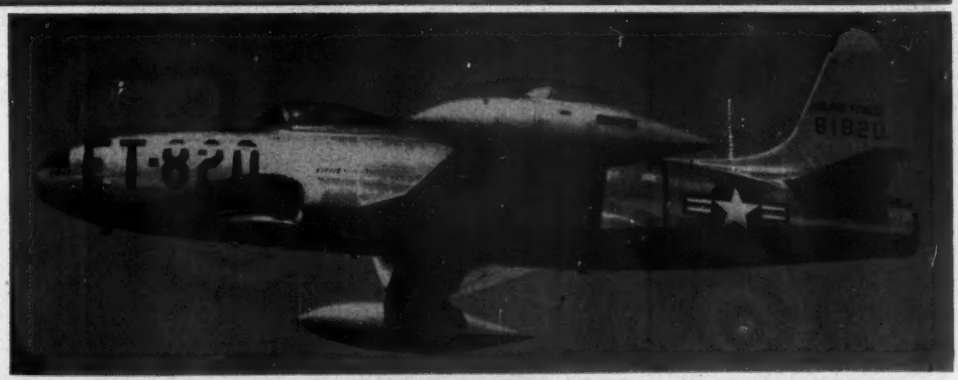
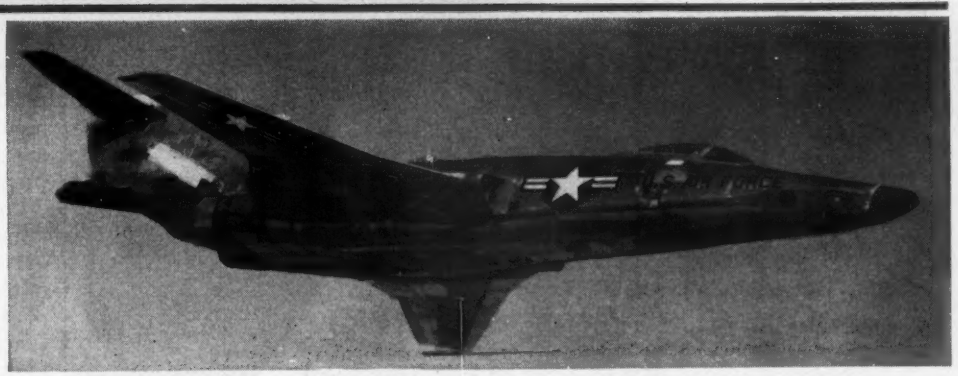


North American F-51s were used by SAC in 1946 as escort fighters when SAC was organized and given global responsibilities.



The Lockheed F-80 Shooting Star was SAC's first jet fighter. It replaced propeller types but its range was limited.

SAC now uses Republic F-84Fs. While retaining the good range characteristics of the earlier F-84s, they perform better.



Still veiled in secrecy, the high-performance McDonnell F-101 Voodoo will soon vastly improve the fighter potential of SAC.

tles and got off with no sweat, except me! I forgot my JATO arming switch and had to stagger off without the added thrust. After reaching the desired airspeed while rolling down the runway, I hit the switch and nothing happened. The imprint of the toggle switch was still on my left index finger when we landed at Guam three and a half hours later. A fortunate up-current of air at the end of the runway got my Thunderjet in the air, and I had to skim over the water for several minutes before I built up enough airspeed to start a climbing turn and head for Guam.

When everybody arrived at Guam, we found a very tired group of ground support personnel. Since they had left Hickam three days before, there was little chance to sleep other than in a bucket seat when being moved from one stop to the next.

We departed Guam on July 15 for Iwo Jima and just after the first aircraft of the 308th Squadron landed, one of my finest officers, Lt. Col. Elmer Da Rosa, crashed and was killed. He was about 3,000 feet over the center of the island when he pitched slightly upward, then down, rolled over on his back and went straight in.

We sailed into Japan the next day, landing at Yokota AFB, to successfully complete the first mass deployment of an entire fighter wing utilizing air refueling. We proved that fighters based in the ZI could be in a battle zone in a very short time.

After one day of rest, the 31st SFW

(Continued on following page)

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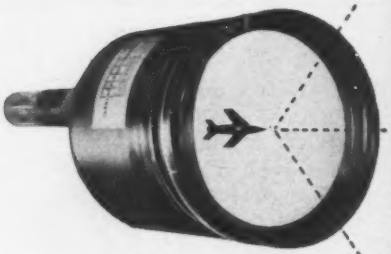
THE TUBE WITH SUN-LIKE BRILLIANCE



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SAC FIGHTERS——CONTINUED

went on a standard air defense alert and also began to get our guns and sights in shape for the FEAF gunnery meet. Ten days later, our boys won the meet by a wide margin and had a celebration that almost equalled the party we pitched to celebrate the end of "Fox Peter One."

Some ninety days later, the 27th SFW from Bergstrom AFB, Tex., replaced the 31st at Misawa. This outfit executed a magnificent flight of four legs from Bergstrom to Travis to Hickam to Midway and direct to Japan. There were no delays, no losses, and the mission was accomplished as planned and briefed. We were happy to see that SAC's planning and briefing for the flight utilized all the recommendations and experience gained by the 31st SFW, who recommended that such a four-leg route be flown on future deployments.

The value of "Fox Peter One" to the United States Air Force was indicated in the fall of 1952 when Air Force Secretary Harold G. Talbott presented the Outstanding Unit Award to the 31st SFW for the successful deployment. This was a new award and we were the first wing in USAF to get it.

"Fox Peter One," the flight of the 31st SFW to Japan, and "Fox Peter Two," the 27th SFW deployment, established beyond doubt the global mobility of SAC fighters.

Before leaving "Fox Peter One," it should be pointed out that the deployment was not an attempt for a speed record. General LeMay directed that we get the 31st SFW to Japan as soon as possible, but further directed that the movement be commensurate with good flying safety practices.

Again in 1953, the 31st SFW was tapped to perform another non-stop over-water deployment utilizing air refueling. We were part of a two-phase deployment called "Operation Longstride." The order directed us to send eight F-84Gs from our base in Georgia to French Morocco—a distance of 4,470 miles. Meanwhile, our sister wing at Turner, the 508th SFW, was to deploy twenty fighters non-stop to England.

Our route was direct to Bermuda, the Azores, and into a SAC base at French Morocco with air refueling over Bermuda, between Bermuda and the Azores, and over the Azores. The 508th was to refuel near Boston, Goose Bay, and Keflavik, Iceland. The flights were to be accomplished simultaneously. Our eight Thunder-

(Continued on page 119)

Tailing an experimental missile in flight takes a special kind of "eye." Seconds after takeoff the missile has kicked through the sound barrier and receded to a fast-moving speck that registers no larger than a few thousandths of an inch in a telescopic field.

To help the Air Force track its missiles, Perkin-Elmer has developed ROTI Mark I (Recording Optical Tracking Instrument). ROTI provides an accurate photographic and magnetic tape record of the missile's flight. ROTI consists of twin 16" aperture telescopes having a range of 7 focal lengths from 50-500 inches, mounted on a large naval gun mount. When used in pairs, it records a missile's spatial position as a function of time with phenomenal accuracy. Velocity, acceleration and attitude can be derived for aerodynamic analysis.

ROTI is more than a precision instrument—it is a complex optical and electro-mechanical system. It was designed and built by an engineering staff with the technical scope and experience to take a systems problem and "see it whole."

Outstanding equipment developed and produced by Perkin-Elmer:

- **the Y-4 Bombing Periscope for the B-47**
- **prototype optical and radar bombing and navigation system now designated MA-2 for use on the B-52**
- **most large aerial photographic lenses in use today by the Air Force**
- **reactor periscopes for the Nautilus and Seawolf submarines**
- **airborne infrared detection systems for military use — these are the real "private eyes" from the security standpoint.**

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jets landed in Morocco without incident after a flight of ten hours, twenty minutes, and twenty-one seconds—twenty-one seconds later than our briefed flight plan! The 508th had two refueling aborts over Iceland, but both pilots landed safely at Keflavik and joined their group in England the next day. This group flew 4,485 miles in less than twelve hours.

Air refueling for this non-stop hop was a serious business, but it had one advantage. What would have been a monotonous ten hours of nothing but watching some 500 miles of ocean and clouds pass under our planes every hour was brightened by the business of transferring fuel to our thirsty tanks. The three air refuelings certainly squeezed the boredom out of the flight.

Along with the ability to refuel SAC's fighters in the air, I'd say that Charlie Blair's new approach to celestial navigation was an immense contribution towards attaining the global mobility SAC's fighters enjoy today. We of the 31st SFW encountered no navigation problems in "Fox Peter One" and "Operation Longstride," nor do I think any fighter pilot properly trained in his method will run into trouble.

SAC now regards deployment of fighters and bombers to all parts of the Free World as routine training maneuvers. In a matter of hours, the B-47s and F-84s can pop up in England, North Africa, Japan, and other points in the Pacific.

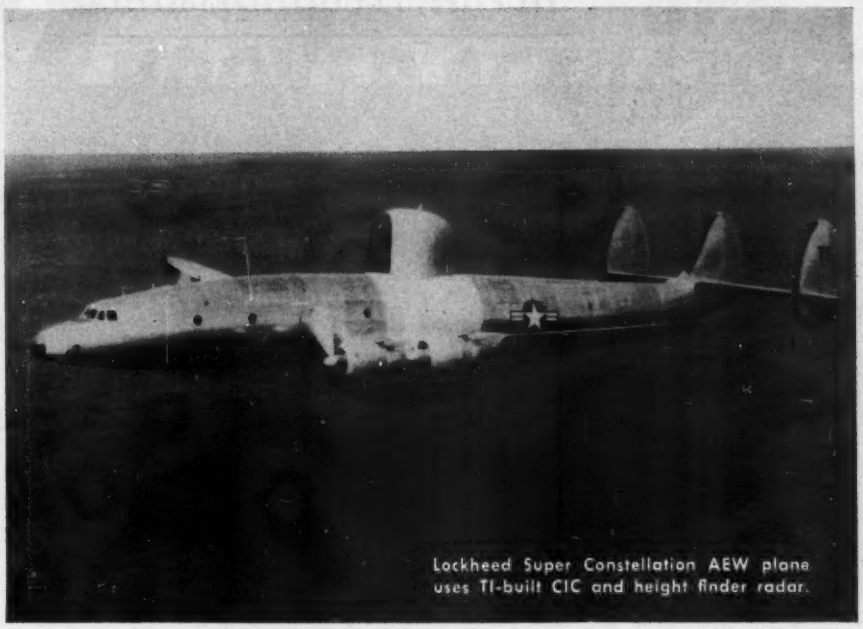
No longer do we have to depend on aircraft carriers and other slow surface ships to transport our planes.

Addition of the new McDonnell F-101 Voodoo to the SAC fighter inventory will give us a greatly increased fighter potential—so great that security precludes further mention.

Looking back on the growth of fighter capability in SAC since 1946, we can view an amazing ten years of development. From the World War II F-47 Thunderbolt and F-51 Mustangs, we graduated into the F-80 Shooting Star, then the F-84E and later the F-84G with its air refueling capability and atomic delivery capability. After the F-84G, we got the sweptwing F-84F and now the F-101 Voodoo is coming up.

Looking back, we can also observe that the Strategic Air Command, whose main mission is to conduct intercontinental strategic bombing missions, has taken the lead in the development of the fighter potential as an effective weapon in modern strategy. —END

about **dollars, decibels, and delivery...**



Lockheed Super Constellation AEW plane uses TI-built CIC and height finder radar.

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SAC *aerial reconnaissance*

St. Augustine, Fla., from 38,100 feet. Aerial photos are an aid to the bombardier and to the photo interpreter.

The Eyes of the Strategists

By Brig. Gen. Hewitt T. Wheless
COMMANDER, 801st AIR DIVISION, SAC

RECONNAISSANCE is as old as warfare, which is to say, probably, as old as the human race. Joshua, the great Hebrew commander, once took a beating at Ai, because he was misled by the reports of his scouts. They told him it wasn't necessary to send his whole army against the place, as it was poorly defended. He took their word for it, and his small force was ignominiously defeated, much to Joshua's humiliation and distress. The Hessians at Trenton failed to observe the movements of George Washington, who crossed the Delaware and captured the lot of them. In the numerous Indian wars which accompanied the opening of this country to civilization, pioneer Indian scouts like Daniel Boone and Kit Carson played a leading role.

With the coming of global "total" warfare, a new type of reconnaissance is called for. In modern war, only a small part of the conflict is waged by the men who slug it out in the front lines. It is now possible, with long-range aircraft and nuclear weapons, to strike at the enemy's homeland, to wreck his means of production, to cripple his transportation, to break his morale, and to render a mighty military establishment impotent for lack of weapons to carry on the fight. To do this successfully, we need to know what and where are the vital targets. And this, in brief, is the function we know as strategic reconnaissance.

Strategic reconnaissance, then, is the examination and survey of territory, on a broad scale, to gain advantage in war. It is distinguished from tactical reconnaissance, which deals principally with support of the front-line armies, by two factors—the range at which it is carried on, and the use to which the information is to be put once it is obtained. It is concerned with missions beyond the front lines—with securing information which will make possible a long-range plan of attack, which will inflict the greatest amount of damage on the enemy, in the places where it will hurt him the most.

There's not a whale of a lot of glory to the reconnaissance mission, but it's a highly important job—one which demands resourcefulness, accuracy of detail, technical skill, and devotion to duty.

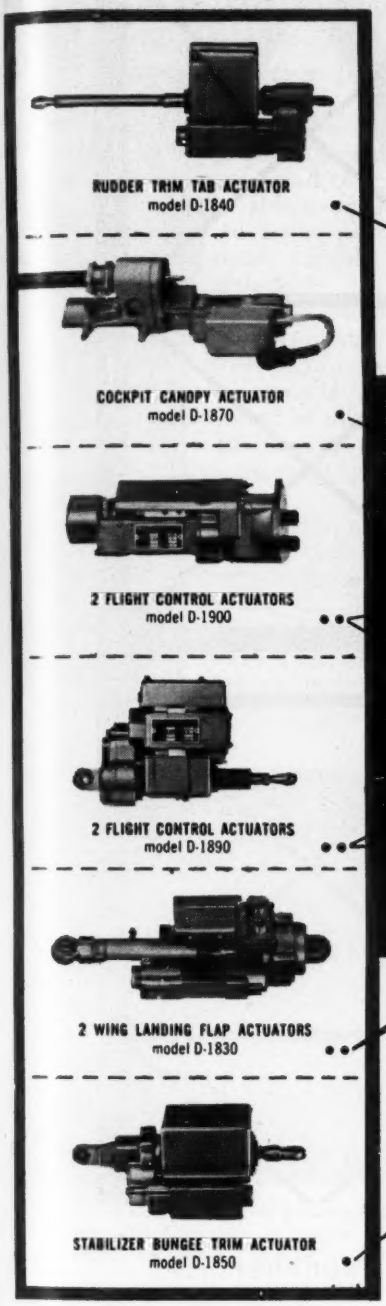
There are other elements involved in strategic reconnaissance besides the primary one of collecting target information. There is the important function of bomb damage assessment—reporting on the degree of success achieved by a bombing mission. That is something everyone, from the President of the United States to John Doe's office boy, will want to know, when and if it again becomes necessary to use our weapons against an enemy: Was the target hit? Was it destroyed? Will we have to go back and hit it again? Strategic reconnaissance must provide the answers.

How does strategic reconnaissance operate? Obviously, it must be carried on in the air. Only from the air is it possible to make the observations needed to provide detailed information of broad scope; only through the air, in time of war at least, can an observer approach the target on which information is wanted. Therefore, we find strategic reconnaissance conducted by the Second, Eighth, and Fifteenth Air Forces, using the newest and best of the Air

(Continued on page 123)

9 HOOVER ACTUATORS

flex the muscles of the Navy's New Fury Jet



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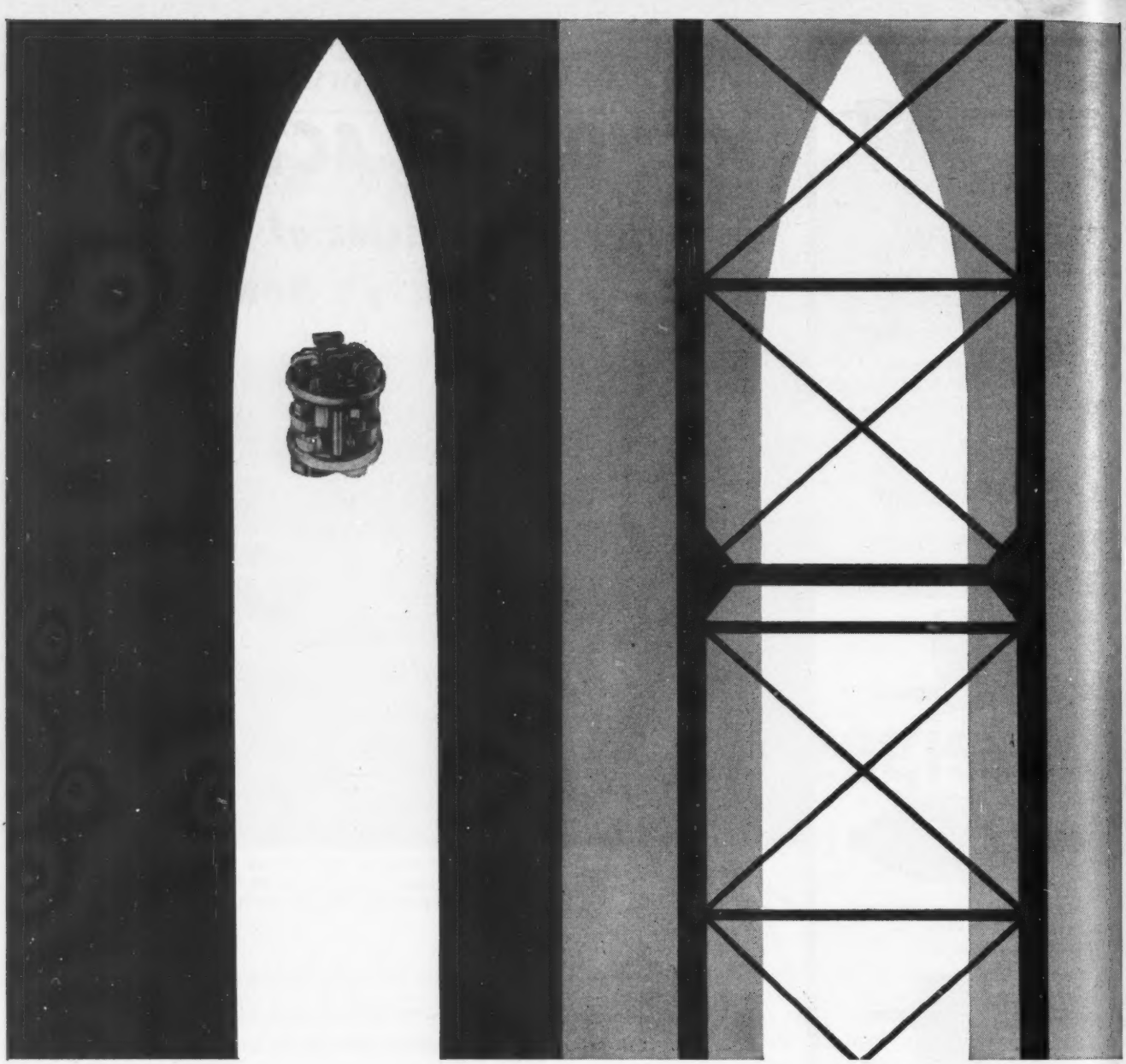

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Force's long-range aircraft, and under the direction of the Strategic Air Command.

Obviously, too, strategic reconnaissance must involve photography. The human memory cannot absorb and retain the quantity of detail that is required; nor would the human tongue be able to adequately report it. Therefore, we find our Air Force planes equipped with specially designed cameras, capable of producing accurate pictures from high altitudes.

Aerial photography began a little more than a hundred years ago, when Aimé Laussedat, a French engineering officer, in 1849 took photographs with cameras supported by a string of kites. Laussedat also was first to advance the idea, ridiculed at first, of using photographs in making topographic maps—the basis on which the whole important science of photogrammetry (measurement from photographs) has been built.

Another Frenchman, Nadar, explored the possibility of using aerial photos to make planimetric maps; and he took the first aerial photographs for military purposes. In 1859, the kingdom of Sardinia was at war with Austria, with France giving active aid to Sardinia. Nadar, whose real name was Gaspard Félix Tournachon, in the service of the Sardinian army, photographed the Austrian position at Salferino from a tent in the basket of a balloon.

Besides collecting target information, reconnaissance has the important function of bomb damage assessment. This photo shows a 200-foot breach in the Chasan Dam in Korea.

Balloons were fine for peacetime aerial photography during the last half of the nineteenth century, and in 1893 an American named Adams patented a method of making maps from such photos. Kites and skyrockets were also used experimentally. Long before the airplane, men had envisioned training teams of eagles to carry them into the sky; and some fanciful souls dreamed up the idea of an automatic camera, to be taken up by a properly trained bird. One man did, in fact, rig up a tiny camera to be attached to a carrier pigeon, with a mechanism to make exposures at regular intervals, the location to be calculated from the speed of the bird.

All these ideas were more remarkable for their ingenuity than for any practical results. They are mentioned here to show that man had set his mind to the problem of taking pictures from the air, and that he was not going to rest until he had done it.

The invention of the airplane coincided with a rapid advance in camera and film techniques to provide a solution to the problem. About 1900 Capt. Theodor Scheimpflug developed the multi-lens camera, which afforded more coverage at one time. Wilbur Wright made the first known photos from a plane at Centocelle, Italy, on April 24, 1909. Four years later, Capt. Cesare Tardivo, an Italian, presented a map of the city of Bengasi, constructed from aerial photographs, at a meeting of the International Society of Photogrammetry in Vienna.

The value of aerial photography for military purposes was demonstrated in World War I. The German army had already taken notice of its possibilities, and a Scheimpflug-Kammerer eight-lens camera, mounted on the basket of a balloon, was used in their maneuvers of 1911.

BRIG. GEN. H. T. WHELESS

Brig. Gen. Hewitt T. Wheless was born in Menard County, Tex., in 1913. He attended the University of Texas, and received his wings in 1939. During World War II he was with the 19th Bomb Group and was Director of Operations of the 314th Bomb Wing in the Pacific. Later he became Deputy Director of Operations, Hq., SAC, and then Director of Operations, Second AF. Since 1954, he's commanded SAC's 801st Air Division, based at Lockbourne AFB, Ohio.

Ground cameras held in the slip stream of open cockpits took the first reconnaissance shots. The next step was fastening the camera to the side of the fuselage. Sturdier cameras and more satisfactory mounts had to be developed. Experiments were carried out at various focal lengths. By the end of the war, vertical cameras mounted in the bottom of the fuselage were in use.

The tri-metrogon process, first suggested in 1941 by Col. Merle E. Parks, is now in general use in the United States Air Force. It involves three single-lens cameras, one mounted vertically, the other two mounted obliquely at an angle of sixty degrees, one to the right, the other to the left. This arrangement permits complete recording of a strip of terrain from one horizon to the other in a single operation, and has proven particularly desirable in charting photography.

At the beginning of World War II, the need for more strategic information was immediately apparent. Less than one-tenth of the earth's surface had been charted. Bombing missions were going out with inadequate information on their targets, and even without the navigational aids needed to find their way in and out of hostile territory.

As the war spread, and the probability increased that the United States would become involved, the importance of a trained and equipped aerial photography organization became vital. The new organization, which was to develop into the Second Air Force, had its beginning in February 1940 when it was activated as the 1st Photographic Squadron, with six flights, each in a different section of the country.

By June 1941, the squadron had become the 1st Photographic Group, and the flights became squadrons. Later, other squadrons were added, another group—the 11th Photo Group—was organized, and the two groups combined as the 311th Photo Wing, mapping and charting. This was the organization which became successively the 311th Reconnaissance Wing, the 311th Air Division, and eventually the Second Air Force.

There is no room here for a detailed account of the numerous missions flown, the hazards encountered, the

(Continued on following page)

A photo interpretation team evaluates possible target areas from photographic negatives on a tri-metrogon camera installation from a SAC RB-47. This type of equipment provides a horizon-to-horizon sweep under the wings of the aircraft, and is now in general use in the AF.

difficulties overcome, and the results accomplished by these reconnaissance men during the World War II.

However, it became increasingly obvious that the expanded geographic scope of aerial warfare had established a real need for a stepped-up strategic reconnaissance capability. This led to the creation, in 1947, of the first strategic reconnaissance unit, commanded by the late Brig. Gen. P. T. Cullen. Simultaneously, a program was set up to develop the aerial cameras and accessories that would support the mission of the new command. As part of the program, more B-29s were modified as reconnaissance aircraft, and close liaison was maintained with the Research and Development Branch of Wright-Patterson Air Force Base to work on high-altitude photography equipment, and with the aircraft industry in the development of aircraft for suitable camera platforms. This coordination resulted in the first aircraft that was truly a strategic reconnaissance type when it left the assembly line—the Boeing RB-50.

The RB-50 was the first aircraft suitable for high-altitude, long-range, reconnaissance missions. Even this aircraft, however, quickly began its losing fight with obsolescence and was supplemented with a wing of North American RB-45s, the first multi-jet type aircraft capable of performing strategic reconnaissance missions, although they were classed as "mediums" because of limited range. Even the RB-50s were not technically designated as long-range strategic reconnaissance aircraft, and it was not until the Convair RB-36 came along that units of long-range reconnaissance were phased into the strategic picture. During the same period, 1951-1952, the six-jet Boeing RB-47 was accepted as a medium reconnaissance aircraft.

In-flight refueling converted the RB-47s, in effect, from medium to long-range reconnaissance aircraft. At present, SAC has five reconnaissance wings.

During this "decade of security through global airpower," one of the most difficult tasks was that of balancing the development of the "air platform" with the reconnaissance tools which give the platform its reason for being. The photographic industry, aware of strategic reconnaissance problems, began to increase the capabilities of our cameras, optics, sensitized materials, and processing equipment. Due to the need for meeting immediate requirements, the majority of this equipment was not new but merely modified.

Strategic reconnaissance has made tremendous strides since the introduction of the RB-29 into the program, but the never-ending search continues for even more effective reconnaissance weapons systems. Current developments reflect the wish to adapt standard aircraft for reconnaissance missions. An example is the use of a "capsule" which, in a minimum of manhours, can convert a B-52 into a reconnaissance aircraft. The capsule contains all the equipment necessary to perform a reconnaissance mission, thereby creating a dual-purpose aircraft at low cost.

No story of strategic reconnaissance would be complete without mentioning the role of the reconnaissance technical squadrons. Their job is to process the vast amount of film taken by the reconnaissance crews, and in addition, interpret the photos and disseminate the information to the using agency. At present, with their automatic equipment, these units can quickly deliver the reconnaissance photos and intelligence to those dependent upon the information for the success of their mission.

The future of aerial reconnaissance envisages a time when remote-controlled aircraft will perform reconnaissance deep into enemy territory with cameras corrected for drift, yaw, and pitch; when automatic devices to compute exposure and shutter speeds at extremely high, as well as low, altitudes will become available; when blur caused by high speeds in relation to target being photographed, will be eliminated; when excellent night photography at great heights will become possible; when scenes will be automatically flashed electronically to a control room where commanders can make immediate decisions for bomber crews either awaiting take-off, or even for crews already en route. This could be the ultimate in reconnaissance. In the meantime, many interim problems will have to be solved in order to maintain the reconnaissance arm of the Strategic Air Command as one of the vital elements of the United States Air Force.—END

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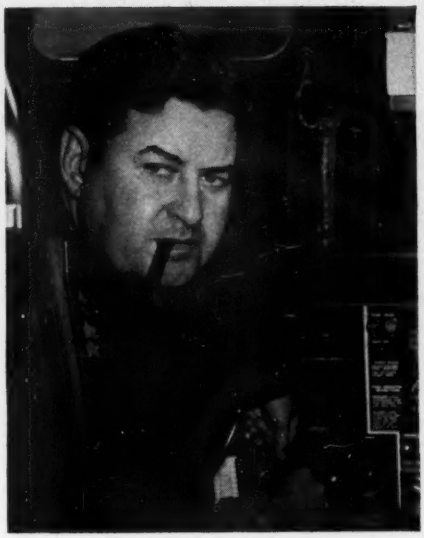


SAC's Readiness Is Our Peace Insurance Policy

By Gen. Curtis E. LeMay
COMMANDER-IN-CHIEF, SAC

FOR centuries it has been the job of the general to win wars. In the nuclear air age his job must be to prevent wars. There is good reason to believe that the military solution to the problem is relatively simple—superior long-range nuclear airpower and adequate defensive airpower *in being*, combat-ready on a continuing basis. This airpower must be strong enough to win, beyond the shadow of a doubt, the decision in any global nuclear war. Without this kind of force in being we cannot expect to keep the peace. This is perhaps the most significant military fact of today.

Therefore, all training, all operations, in the Strategic Air Command add up to one simple purpose—readiness for combat on an instant's warning, anywhere in the world. If we are not ready—in terms of trained men, modern equipment, and effective organization—then SAC is wasting its time.

Military power, in any form, has always been a matter of men, and for the foreseeable future it will continue to be. The day of the pilotless long-range bomber and the guided missile is coming. As they become available they will augment the manned force and, very slowly, may even replace it.

But in SAC we can take no comfort in the prospects of being combat-ready five years from now, or one year from now, or even tomorrow. Our prime interest is in readiness today, this instant. To do so we need men of the highest caliber, trained to the peak of perfection, armed with sufficient quantities of the best equipment the nation can supply them.

Among the almost 200,000 personnel of the command, motivations naturally vary greatly from person to person, yet there is one attribute that is common to almost all SAC people. This is the satisfaction they derive from knowing that the force they have helped to build, and which they maintain in a state of constant readiness, is vital to the security of the Free World. They know that they are making a contribution toward the achievement of lasting peace. These people represent the finest in the military tradition—these who choose service to their country above all other considerations.

Building the Strategic Air Command to its present high state of readiness was, essentially, a matter of bringing the men and the aircraft together, and exercising them constantly on combat training missions, which duplicate actual war requirements. Realistic training is our greatest continuing need, and many hundreds of hours of study are required to master today's highly complicated air equipments.

Consider, for example, the fact that three men in a B-47 bomber do substantially the same jobs that eleven men did in the World War II B-29. Their training has to be broader and more technical, and the demands on each man are greater. Not only must everyone achieve high standards of proficiency in his own job—he is often cross-trained to the other jobs as well.

Ever since the Strategic Air Command was activated, it has been necessary to work on the assumption that a war might start at any time. It is a fact that hours—even minutes—might spell the difference between victory and defeat. Therefore, there has always been a certain urgency to our operations. It is essential to be ready to go—not next week, nor tomorrow, but today—now, if the need arises.

It is our responsibility to know how well the combat crewmen of SAC can do their jobs. In determining this we have had to ask—and answer—three questions. We would like to give you both questions and answers, for they bear on our conclusions.

First, can SAC combat crewmen, flying from bases here and overseas, find their targets with certainty? The answer is an unqualified yes. On celestial navigation alone, our crews can fly to within fifteen miles of any spot on earth, and from there move on their targets with precision by means of radar navigation.

(Continued on following page)

Second, when they arrive over their targets, can they destroy them? Again, the answer is an unqualified yes. By means of carefully scored bombing runs, each of these crews has proved its ability on hundreds of occasions. I should like to point out that their targets are not cities —they are often specific corners of buildings within military target areas. By a combination of radar and radio, we can tell with what degree of accuracy any given crew is bombing.

Third, having destroyed their targets, will these crews get back? Again, the answer is yes. In World War II, using mass formations of bombers, subject to massed attack, our percentage of losses was less than two percent. With many hundreds of jet bombers utilizing optimum tactics, in small formations or on single-plane penetrations, the odds are equally in favor of our bombers.

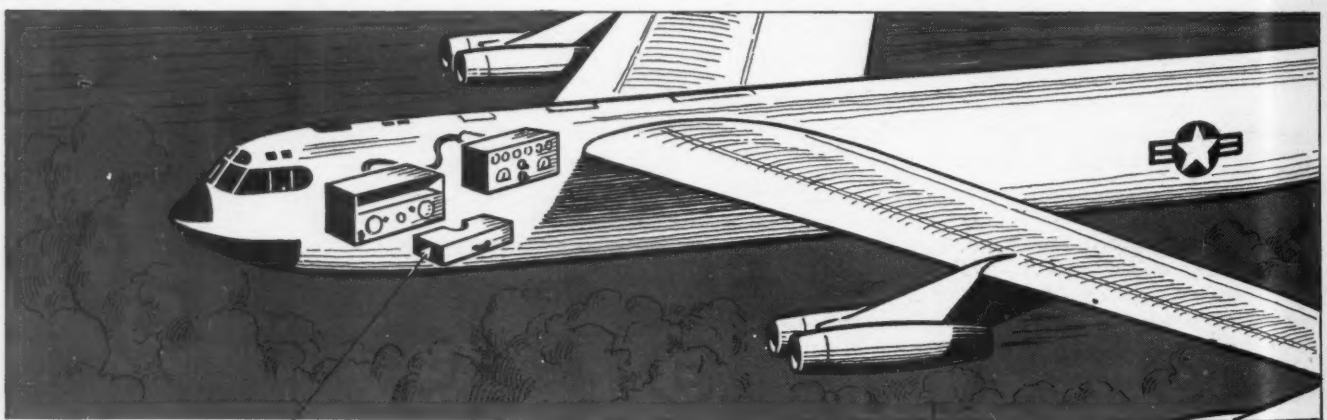
Today we have a combat-ready force in being—and I think there is good reason to hope it may never have to be used. The strength it poses to any potential enemy as of now is so great it is very probable that he will not risk its blows. There is no profit in aggression if it brings on self-destruction. Therefore, we may well regard the Strategic Air Command as peace insurance, and the premiums we must pay to keep it more modern than the strategic air force of any nation are not high. If we never have to use the power we have built into SAC, it will have justified its cost many times over.

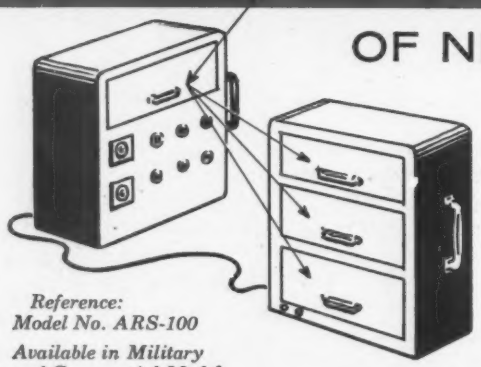
We must face squarely the fact that the United States no longer enjoys a monopoly on long-range nuclear airpower. It was inevitable, of course, that the Communists would build this most potent type of force as quickly as they could. The fact they now have such a force, however, in no way detracts from the deterrent power of our own. It is not likely that any major attack could be made on the United States without the aggressor nation suffering disaster. As long as a potential aggressor is convinced of this, I do not think we have to worry about a major war. Our main job is to keep him convinced.

We are not a belligerent people. We prefer to devote our inventive natures and our industrial capacity to providing better lives for ourselves and for others. In the past this inclination has been mistaken for weakness, and as a result, we have been drawn into two world wars in a single generation.

I would not say to you that SAC is the ultimate of military tools. Today, it is our best and most formidable military expression, and for the foreseeable future it appears clear that the long-range bomber and the nuclear bomb will be required in sufficient numbers, and of superior quality, as a national insurance policy. We must keep it that way, at the same time pushing forward our research and development programs on advanced type aircraft and guided missiles to guarantee future leadership in the air.

The airman knows the futility of war and his job today is to help prevent war from happening. We can and must insure our security by our continuing efforts toward a peaceful solution to world problems, backed up with the type of military strength our potential enemies fear most. In such an atmosphere, with that strength behind our position of moral leadership in the world, we can look to the future with confidence.—END





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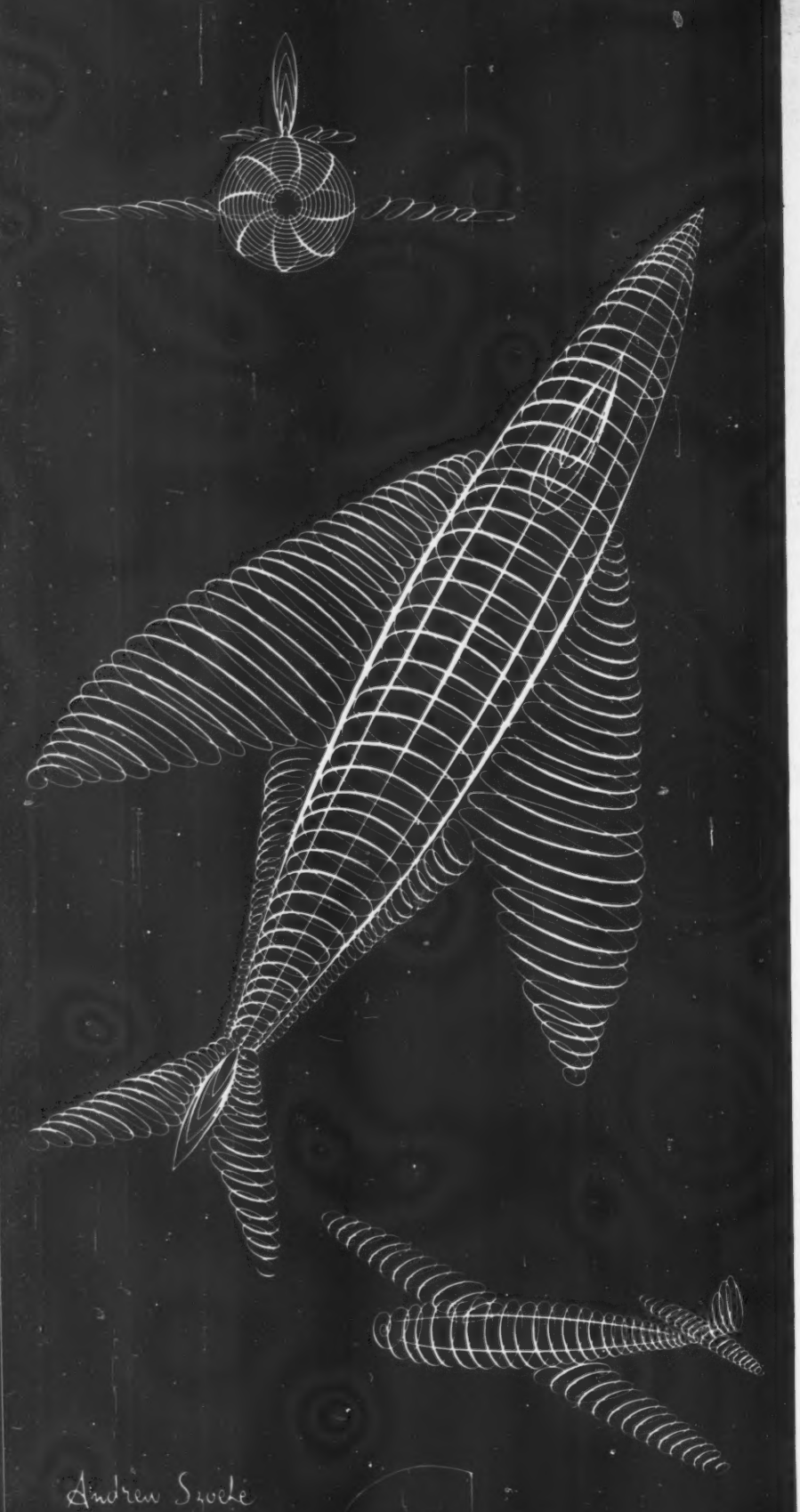

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What came out of . . .

The Jet Age Conference

WHEN the Air Force Association called a Jet Age Conference in February, it hoped to focus nationwide attention on the fact that facilities and procedures have not kept pace with modern aviation equipment. Subsequent events seem to indicate that the conference in Washington, D. C., did just this.

In reporting the conference, the Evansville (Ind.) *Courier* said: "Military and commercial aviators are facing a problem of congestion that is coming to rival the crowding of the nation's highways. . . . It's the jet plane that's aggravating the problems which are three-fold. . . . Airports, navigation aids, and air traffic control were lagging far behind the growth of air traffic and the development of new aircraft."

But unlike crowded highways, the air traffic problem can't be solved by just building more airports and runways. A good example is the situation in Detroit. Jean Pearson, aviation writer for the Detroit (Mich.) *Free Press,* put it this way:

"On the ground you have two large airports—Willow Run and Detroit-Wayne Major. In the air you have only one. The reason is that the airports are less than eight air-miles apart. Together they make one air traffic hub. The more you expand air traffic at either airport, the greater the congestion grows."

For some time now the airlines have had their own brand of community relations problems. But only the Air Force has had to live with jet problems. Almost singlehandedly, the military has had to wage the campaign for public acceptance of the Jet Age. Now that most of the major airlines have ordered commercial jets—and those who haven't most probably will—problems that heretofore were considered exclusively military have been suddenly dumped into the nation's backyard.

With the traffic in our skies already at the critical stage, the experts agree that our airport and air traffic situation requires a long searching examination and perhaps a complete reorganization.

Recognizing the urgency of the situation and the need to bring together the people who would have to solve the problems, the Air Force Association rolled up its sleeves and set the stage for the two-day meeting in Washington. But the success of the event depended upon the participants—the speakers and the guests.

More than 1,500 persons registered for the conference. They represented all phases of aviation—industry, military, federal government, state and municipal government, and members of Congress. They heard talks by persons who know the jet problems—AF Secretary Donald A. Quarles, AF Chief of Staff Gen. Nathan F. Twining, and Gen. Earle E. Partridge, Commander-in-Chief of the Air Defense Command and the Continental Air Defense Command. They also heard Milton Arnold, a vice president of the Air Transport Association, and William Littlewood, a vice president of American Airlines, discuss the commercial point of view. A Noise-Abatement Forum included eight men with long experience in this field. The scientists were there, too—Dr. Hugh L. Dryden, Director, National Advisory Committee for Aeronautics, and Dr. George E. Valley, Jr., Associate Director, Lincoln Laboratories, Massachusetts Institute of Technology. An Air Traffic Control Forum was composed of eight men who knew navigation, control and flying. The guests also heard Charles J. Lowen, Jr., Administrator of the Civil Aeronautics Administration, and persons representing the viewpoints of the business and private pilot, airport operators, and just about every phase of aviation related to the over-all problem.

The men responsible for getting the word to the people were aware of the significance of this gathering. They sent sixty-seven newsmen—representing the major dailies, radio and TV networks, wire services, magazines, and most of the aviation press.

The conference couldn't—and didn't attempt to—solve the problems of the Jet Age. But it did focus attention on the problems. Press, radio, and television coverage was excellent—the conference attracted at least as much attention as an AFA National Convention. Several of the speeches have been reproduced in the *Congressional Record* and others have been reprinted in other journals including *Noise Control,* an official publication of the Acoustical Society of America.

Municipal government officials from all parts of the nation carried the message back to their home towns. As reported on the front page of the West Palm Beach (Fla.) *Post* several days after the conference, "The era of jet transportation may sound a death knell for Palm Beach

(Continued on following page)

". . . There have been two significant conferences to pinpoint the enormous problems created by the jet airplane and the great increase in air traffic of all kinds . . . the jet airport conference called by CAA Administrator Charles Lowen . . . (and) the two-day Jet Age Conference sponsored by the Air Force Association.

". . . Here was freedom of expression and freedom of thought at its best. The top command of the Air Force did itself proud by its frankness and its obvious willingness to cooperate. The CAA has taken on a fresh and candid approach mixed with a new desire to do something. Organizations representing everything from air defense to airports, airlines, business craft and aviation safety, all pitched in with something akin to crusading zeal to spotlight the problems as the first step toward building something new and better.

"Only in America could one find such spontaneous leadership. Full credit must go to both CAA and to the Air Force Association for sparking two constructive forums.

". . . The problems are beyond the range and scope of any single government agency or any organization. They are national and they must be solved through national direction. The sooner they get high-level attention the better."

Wayne W. Parrish, *American Aviation*

". . . There were indications . . . that the conference struck the spark of a movement that may carry the military and aircraft industry's story to the state level. Among AFA Chapters who announced plans to hold similar conferences at state level were those from Florida, California, Illinois, and Michigan."

Air Force Times

International Airport, Commissioner Kenneth Foster (Palm Beach County Commissioner) told his colleagues at a regular session of the County Commission Monday morning.

"Foster, who visited Washington last Friday and Saturday with Col. Henry G. Thorne, Jr., commander of Palm Beach AFB, revealed startling facts as he reported on a Jet Age Conference.

"'. . . To land these [jet] planes,' Foster declared, 'requires a runway of 200 feet wide and 10,000 feet long for single motor jobs—300 feet wide and 11,000 feet long for multiple jet-engined planes.'

". . . Foster said the conference was the most constructive he ever attended. Every top technician in aviation was on hand and the program . . . included speeches on many phases of flying."

The story went on to report that Foster's experience at the Jet Age Conference led to his sponsoring a reversal of commission policy regarding acquisition of ten acres of land controlled by the Air Force. The commission has felt that the AF regulations which were part of the land grant would not be desirable. Foster did not agree with this after his attendance at the conference.

At presstime last month, we were still too close to the conference to really determine what it had accomplished—aside from the encouraging immediate reaction in the press and from those who attended. Events since then have justified our earlier enthusiasm that the conference served a definite purpose.

The talks and the forums triggered countless editorials in papers throughout the nation who view the Jet Age problems as not only a national problem but a local one as well. In addition, it stimulated a series of similar meetings in all sections of the country, and sparked the production of several radio programs using a Jet Age theme.

As an aid to those planning Jet Age Conferences, AFA national headquarters has prepared special kits with detailed information (including half-day and one-day agendas).

Successful AFA-sponsored conferences have already been held in Baltimore and Miami. More than a dozen state or regional Jet Age Conferences will be held under AFA sponsorship in the next few weeks (see "AFA News," page 147). Anyone interested in staging such meetings is encouraged to contact AFA headquarters in Washington.

The Jet Age Conference was the latest, and largest of a series of Airpower Conferences staged as part of AFA's Industrial Associate program.

The first of the Airpower Conferences was one on Air Force manpower held in Washington in June 1954. This meeting resulted in a continuing industry program to aid in solving the AF's manpower problem.

During 1954 and 1955, three of the major USAF commands cooperated in successful Industry-Air Force meetings—the Strategic Air Command at AFA's 1954 Convention in Omaha; the Air Defense Command at Colorado Springs; and the Tactical Air Command in Washington, D. C. Also, in Washington in 1954, air logistics was examined publicly for the first time. The AFA-sponsored conference had a speakers' panel that included Secretary Talbott and General Twining, and more than 800 industry and military leaders were there.

Last year at the National Convention in San Francisco, one day was set aside as Industry Day. This will be repeated again this year at New Orleans, and the event will consist of two special briefings for industry—one Wednesday afternoon, August 1, and the other Thursday morning, August 2. Industry Day will be climaxed by a USAF-Industry luncheon.

The Industrial Associate program has been equally well received by Industry and the Air Force and is proving that Industry is a true "partner in airpower."—END

". . . a well conceived and brilliantly executed idea."
Ira C. Eaker, Lt. Gen. USAF (Ret.)
Hughes Tool Company, Aircraft Division

". . . a terrific meeting . . . extremely helpful to every segment of the industry. . . ."
Charles J. Lowen, Jr.,
Administrator of Civil Aeronautics

"I have attended hundreds of meetings during the past 30 years, but never before have I attended one where all of the papers and statements were of such uniformly high quality."
A. B. McMullen, Executive Secretary,
National Association of State Aviation Officials

"...an excellent meeting, well conducted and organized."
Robert E. L. Eaton, Maj. Gen., USAF,
Commander, Tenth Air Force, Selfridge AFB, Mich.

You can still get additional copies of the March issue of AIR FORCE Magazine, containing a complete transcript of the Jet Age Conference. Prices, including packing and shipping are: 1 through 100, @ 35¢; 101 through 500, @ 30¢; 501 through 1,000, @ 25¢; 1,001 and over, @ 20¢. Mail coupon below for prompt handling.

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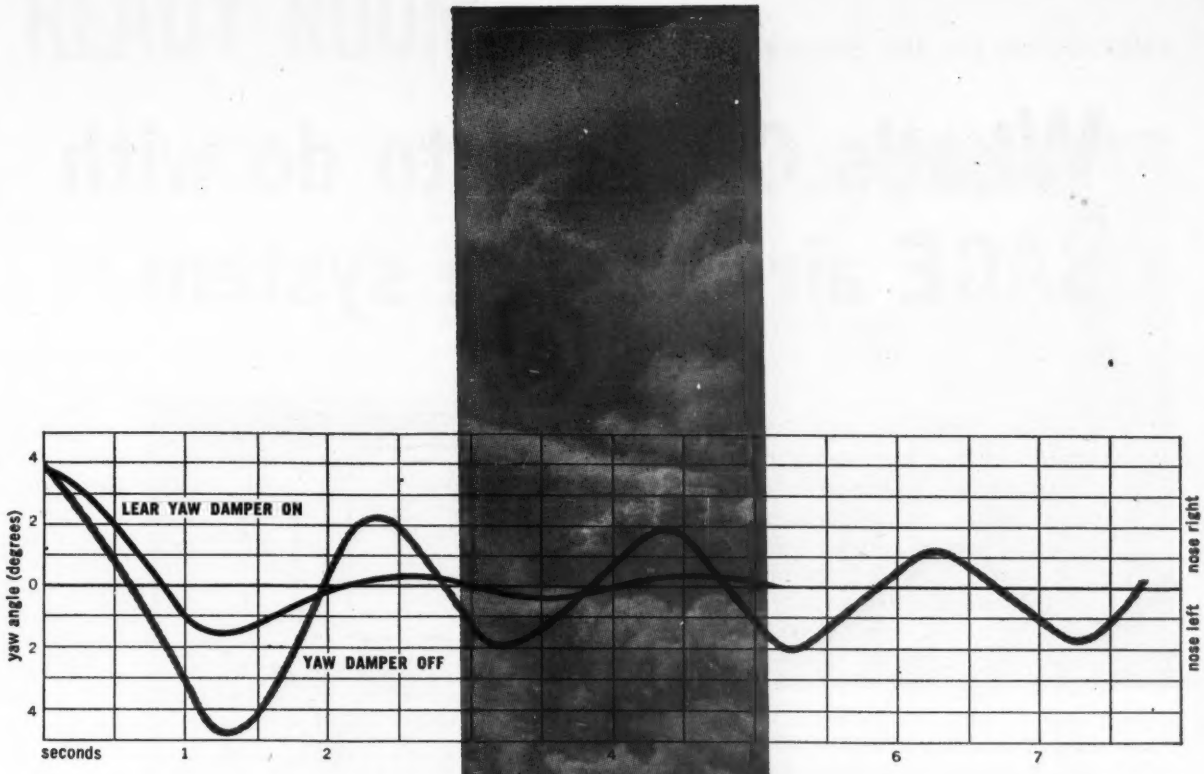
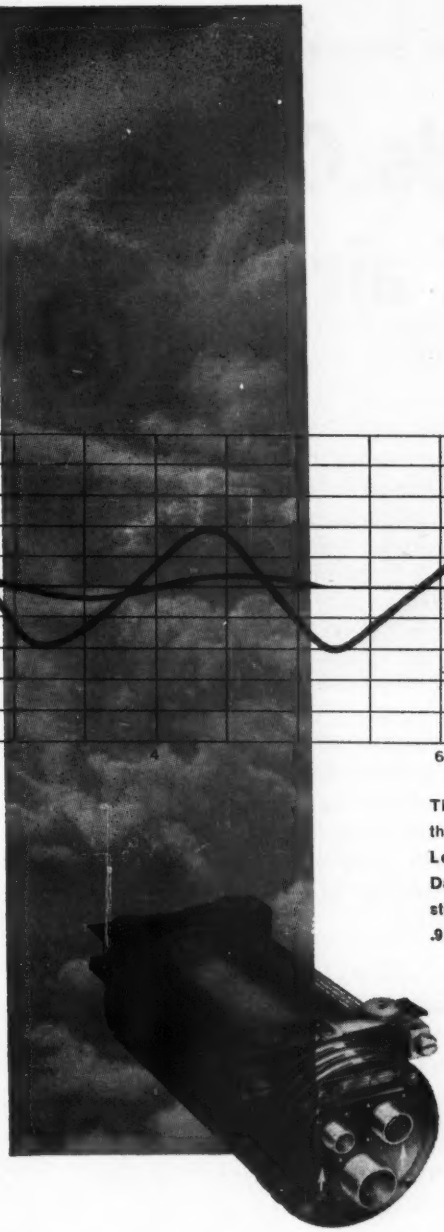


The NAA data presented here show the difference in damping time between Lear Yaw Damper "off" and Yaw Damper "on" operation, starting from steady side slips with full rudder, at .9 Mach number, altitude 40,000 feet.

to increase "kill" probability



Weapon system design combines many arts for the purpose of annihilating the enemy. The spectacular stabilizing effect of the Lear Yaw Damper on the flight path of the F-86D Sabre is shown in the above curves prepared by North American Aviation, Inc., for the enlightenment of fighter pilots. "From these data," says NAA, "it is clearly seen why the yaw damper is an essential device to make your airplane a more effective and efficient rocket firing platform."

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This is another example of how Lewyt technological skills are keeping abreast of the most recent developments in electronics.

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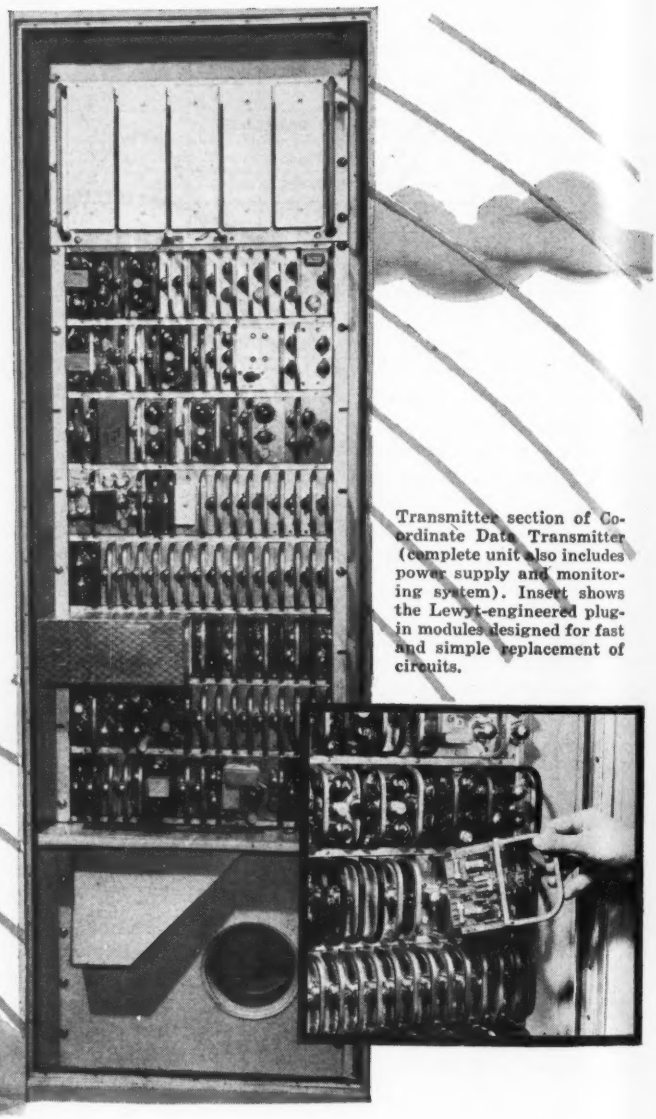
**Coordinate Data Transmitter*



Transmitter section of Coordinate Data Transmitter (complete unit also includes power supply and monitoring system). Insert shows the Lewyt-engineered plug-in modules designed for fast and simple replacement of circuits.

LEWYT

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The READY ROOM

RESERVE AND AIR GUARD NEWS

More than two years ago **Arkansas** asked the Air Force and the National Guard Bureau for a **second Air Guard flying unit.** The state's one squadron—the **154th** at Little Rock—had made a fine record in Korea, and Arkansas wanted another unit of matching caliber.

Contrary to popular belief, it takes more than mere desire to locate an Air Guard flying squadron. But **Fort Smith,** on the Arkansas-Oklahoma border, wanted the squadron so much that it was prepared to solve any problem to get it.

In eight months the city produced the money to acquire **ninety acres of** land needed for runway extensions, cleared approaches, and construction areas. Last month, construction completed, the city's efforts paid off when the new home of the **184th Tactical Reconnaissance Squadron** was dedicated (*see cut*).

View of Fort Smith, Ark., air base—new home of the 184th Tactical Reconnaissance Squadron, Arkansas ANG. Squadron's primary mission is night photography.

More than **$3 million** was spent to lengthen runways, erect hangars, shops, fuel storage dump, and supply buildings, and construct a mammoth parking ramp. The more than 500 members of the squadron ante'd up enough money to build their own swimming **pool.**

The 184th, presently equipped with RB-26 light bombers, is scheduled for transitioning to the **Martin RB-57** twin jet bomber.

* * *

The Air Force has established **a new group** within the Directorate of Personnel Planning and has named a long-time Reservist, **Col. John C. Crain** (*see cut*), as its boss.

The new group, Air Force believes, will provide a focal point for the **numerous Reserve functions** of the Directorate of Personnel Planning. Already, for example, Colonel Crain's group has taken over the job of developing personnel projections and programming. The consolidation of efforts into one office is expected to aid materially in developing the annual request for appropriations to support the Reserve personnel program. Further, one office now will be responsible for recommending changes in plans, policies, concepts, and organization of the Air Force Reserve.

Colonel Crain returned to active duty three years ago, after four years in the inactive Reserve. He's been serving as Special Assistant for Reserve Affairs to **Maj. Gen. William S. Stone,** Director of Personnel Planning. He will continue in this capacity, in addition to holding his assignment as chief of the new Reserve Forces group.

Col. John C. Crain heads new Reserve Forces Group within the directorate of Personnel Planning at Hq., USAF.

* * *

Continental Air Command is in the process of selecting seventy-five airmen for **direct commissions.** First Air Force has been allocated twenty slots, Fourth Air Force has been given nine, Tenth Air Force has been given ten, and twenty have gone to Fourteenth Air Force. The remaining appointments will be made among airmen assigned to other major commands.

The current number corresponds to the total given direct commissions last fiscal year. To qualify, airmen must meet certain age and physical standards and be free of any Selective Service obligation. In addition, all selected must have completed at least one year in active Air Reserve training programs.

* * *

Eighteen officers and two non-coms, who comprise the **Reserve and Air Guard Policy Committee** of Tenth Air Force, have ended their twelfth semi-annual session with twenty-two recommendations aimed at improving the Reserve and Air Guard programs.

Among the recommendations were these:

- **Reenlistment bonus** for non-commissioned officers of Tables of Organization units, similar to that in effect for the active-duty Air Force.
- **Compensation** for Reservists injured traveling to and from authorized training assemblies.
- Establishment of an **Air Force Reserve Bureau** in the Pentagon.
- Equalization of **retirement ages** among the services.
- **More modern aircraft** for the Reserve Forces.
- Revision of the **Reserve Officer Personnel Act** to permit voluntary rejection of promotion without prejudice, if an officer desires to retain his position in a unit.

Recommendations will be screened at Continental Air Command before being passed on to the Air Staff Com-

(Continued on following page)

mittee on Guard and Reserve Policy in the Pentagon.

* * *

The **Air Force Association's** third annual **Earl T. Ricks Memorial Trophy** event for Air National Guard jet pilots will be held this year on July 28 between San Francisco and New Orleans.

This major AFA event is designed to test the proficiency of ANG pilots and, in the process, to point up the active part the Air Guard plays in the air defense mission. The event is named for the late **Maj. Gen. Earl T. Ricks,** former Chief of the National Guard Bureau's Air Force Division.

The 1956 event will be restricted to **F-86 Sabrejet** aircraft, a departure from last year when all aircraft types in the Guard program were entered. The decision to hold the event to one type of aircraft was made by the Guard Bureau because of the almost impossible task of establishing a foolproof handicap system and to simplify logistic support.

The 1954 winner was **Lt. Charles Young** of New Jersey, and last year's winner was **Lt. Col. James A. Poston** of Ohio. The Ricks Trophy will be presented to this year's winner at AFA's Airpower Awards Banquet on August 4 in New Orleans during the Association's tenth annual National Convention.

* * *

Last August delegates to the ninth annual **Air Force Association Convention** in San Francisco adopted a resolution calling for the position of Assistant Chief of Staff for Reserve Forces to be elevated to **three-star rank.** It was noted then that the position originally was set up for a lieutenant general but that no one of this rank had held the spot since the original office-holder, **Lt. Gen. Elwood R. Quesada,** now retired.

Last month Congressional interest developed when **Sen. Margaret Chase Smith,** Republican of Maine, introduced legislation to make the Assistant Chief of Staff for Reserve Forces a lieutenant general.

* * *

Notes on the Back of a Form 175. . . . **Indiana** has a **bonus** for the state's **Korean war veterans** or their next-of-kin. Deadline for filing applications is **June 30.** . . . ConAC has no directive denying **Reservists points** toward promotion and retirement for attending **National Resources conferences** as representatives of companies employing them. These Reservists can receive points if they are authorized in advance to attend such conferences and if they report on the conferences as required by regulations. . . . **Ten spaces** have been allotted the National Guard Bureau for the **Air Command and Staff School** class beginning September 1. The course lasts thirty-nine weeks. Applicants must be cleared for top secret, be either majors or lieutenant colonels, have between ten and fifteen years of commissioned service, and be not older than forty-three.

. . . There will be **no Air Guard liaison officers** at USAF basic military training schools this summer. This change is due to the fact that Guard airmen will be attending these schools in a federal, rather than state, status. . . . National Guard Bureau **has stopped sending out the supplemental letter of instruction** for field training. Instead, the Bureau will issue an annual numbered letter covering field training.

. . . ConAC has plans to organize a number of **Air Reserve rescue units.** The first is scheduled for activation at **Miami** in July. Its equipment will consist of five Grumman SA-16s Albatrosses.

—EDMUND F. HOGAN

Carol Gregerson, named Miss Air Force Reserve of 1956 by two Air Reserve groups in the Seattle, Wash., area.

The new Air Reserve Center at Albany, N. Y. — first one to be constructed from appropriated AF funds. It was officially dedicated on January 6, 1956.

At dedication of Albany's Air Reserve Center, from left: Col. C. Lyman Calahan, CO, 9052d Air Reserve Group; Col. John M. Stutzman, Jr., CO, 9073d Air Reserve Group; Albany Mayor Erastus Corning II; Maj. Gen. Roger J. Browne, CO, First AF; and Lt. Col. Frank Forchtner, CO, Albany Air Reserve Center.

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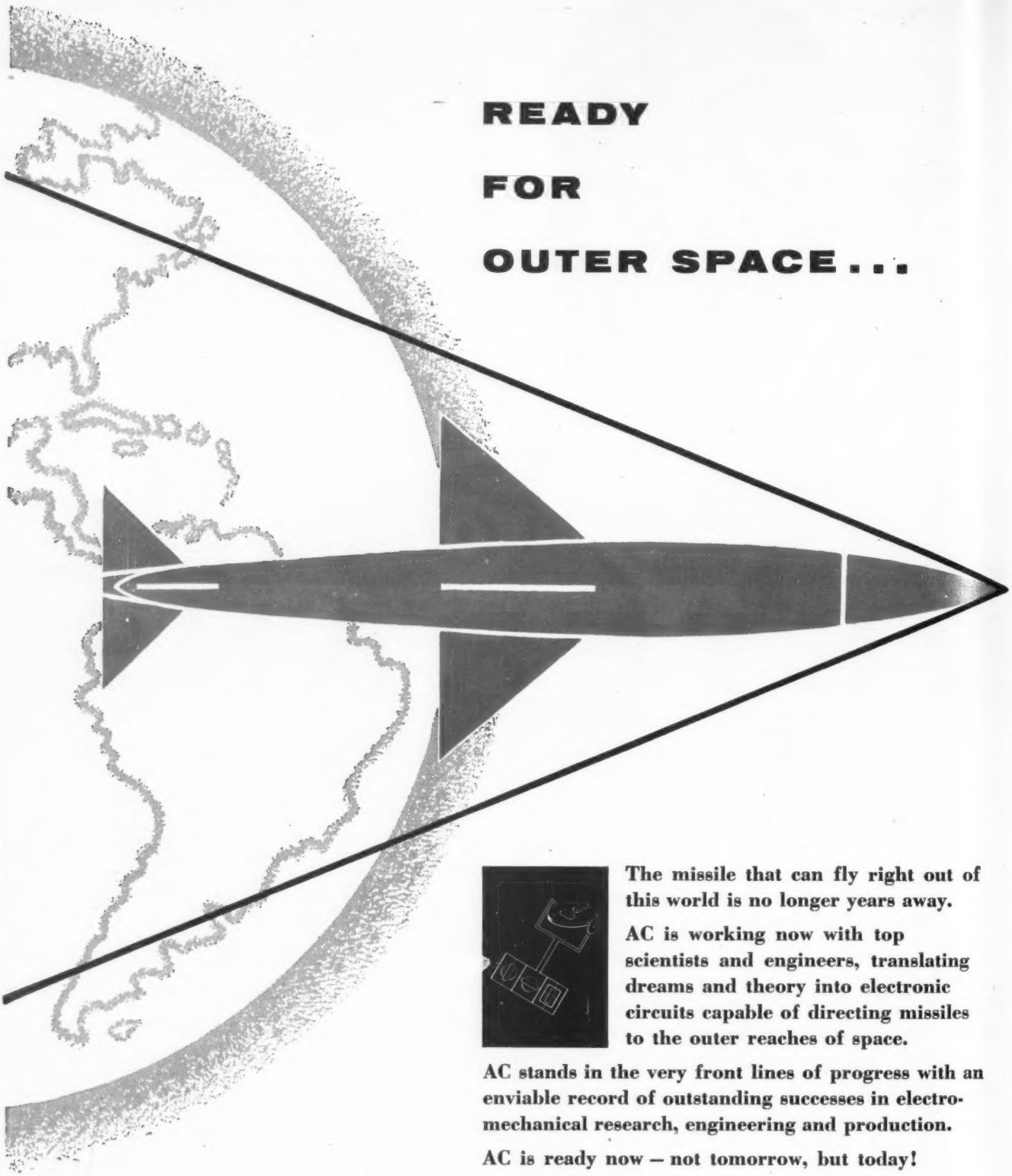

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Tech Talk

The AF has released the first pictures of its Northrop SM-62 Snark long-range missile (*see cut*) currently undergoing tests at Patrick AFB, Fla. The missile—said to be capable of "delivering an **atomic warhead** over transoceanic distances" – is powered by an **Allison turbojet engine.** Both the airframe and the guidance system were developed by Northrop.

The new version of the **Martin Matador** has been successfully tested at Holloman AFB, N. Mex. This missile, designated **TM-61B,** is longer than the earlier model (*see cut*), and will be equipped with an **entirely new guidance system** for tactical missions. Comparable in size to jet fighters, it flies to its target at near-sonic speeds.

The USAF has announced that its **1,600-mile missile range** (*see map*) will soon be fully equipped with twenty-one radar tracking stations. These stations will **automatically track missiles** speeding along the range from Cape Canaveral, Fla., into the South Atlantic beyond Puerto Rico. Data—position, course, velocity, and acceleration—is **simultaneously recorded and transmitted** to the central control station at Patrick AFB. Recent long-range tests were made with all but the southernmost station.

General Electric demonstrated its new **IBM 704 electronic computer** at the new aircraft gas turbine development facility, Evendale, Ohio, by coupling the computer with a jet engine being tested in Lynn, Mass. A **closed-circuit TV hookup** fed test results into a transceiver system and automatically transmitted the data to Evendale where the data was fed to the computer for calculations. The test in Lynn was also watched on a large screen television set located adjacent to the computer in Evendale.

The **Admiral Corporation** has developed an **airborne television system** that will enable battle commanders to watch combat sectors on an ordinary commercial television set at command posts. A plane carrying a camera and transmitter at approximately 1,000 feet would have a line-of-sight **transmission range of about twenty-five miles** from the post. A panel of seventeen-inch TV screens would provide a commander with an immediate over-all picture of the combat sector. The system was designed for the Army Signal Corps.

A new **bombing-navigation system, called Brane,** has been developed and installed on **Boeing B-52 Stratofortresses.** The Brane will navigate the bomber to its destination and automatically direct the plane through the bomb run—even under strenuous operational conditions – responding to corrections made by the bombardier-navigator. It was developed under the direction of the Air Force by **International Business Machines Corp.**

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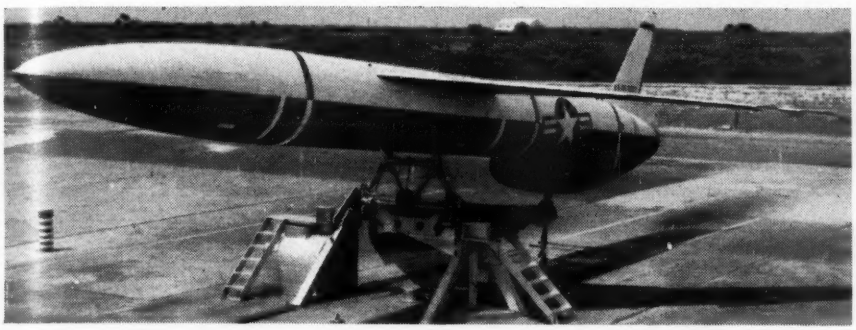
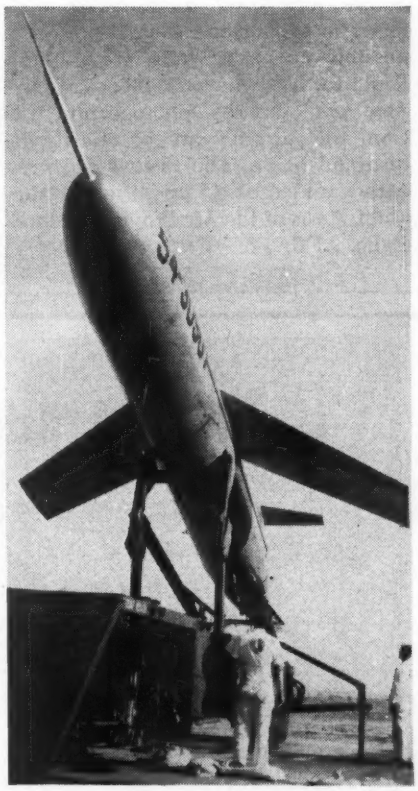


The AF's Northrop SM-62 Snark perches on a cleared pad at Patrick AFB, Fla. It uses a star-tracking guidance system and is the size of a light bomber.

Radar stations on the AF's guided missile range automatically track missiles.

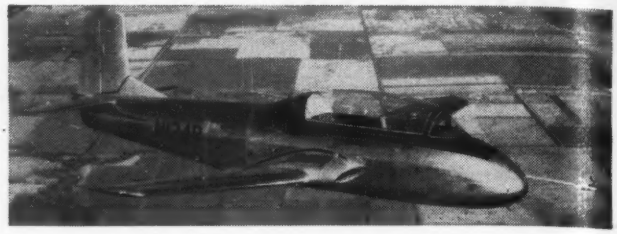


New version of the Martin Matador—the TM-61B—has a bigger nose and is longer than the TM-61. The missile is launched from a thirty-nine-foot trailer and is electronically guided to its target from the ground.

Beechcraft's Model 73 Jet Mentor (*see cut*) has successfully completed its initial flight tests. This privately-financed jet trainer was built to military specifications to provide students with **dual instruction in acrobatics, night flying, basic instrument training and jet engine operation.** The trainer, powered by the **Continental J-69** with approximately 900 pounds thrust, has a normal cruising speed of 245 mph.

The **Atomic Energy Commission** has patented a pocket-sized **radiation-detection device.** It reacts to a predetermined amount of radiation by producing an audible signal warning the bearer of overexposure.

Decoy **North American F-86F Sabres** are being produced in Germany **to attract and divert the fire of possible enemy aircraft.** It's not difficult to tell which is the real F-86 (*see cut*) in the photographs, but from the air they are practically indistinguishable. The decoys are presently undergoing operational suitability tests at the **Air Proving Ground, Eglin AFB, Fla.**—END



Maiden flight of Beechcraft Model 73 Jet Mentor, a two-place tandem jet trainer.

The F-86F (top) and its decoy. Indistinguishable from the real thing from the air, the decoy was developed to attract and divert the fire of attacking enemy aircraft. The German-built decoy is being tested by the AF.

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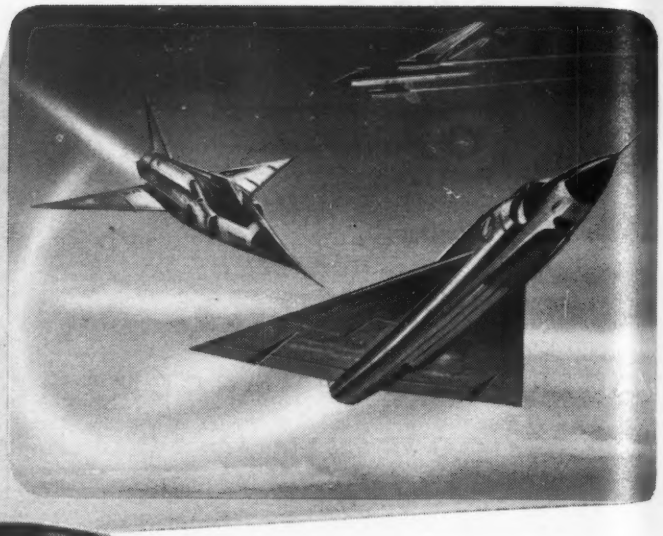

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This new professional training instrument combines all proven visual training techniques in one versatile unit. With the PerceptoScope you change instantaneously from still projection to tachistoscopic (flash) or *animation* . . . all at variable projection speeds . . . remote controlled by a unit in the instructor's hand.

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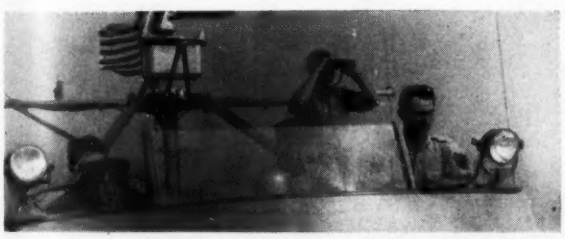
USAF Crash Boats on Lake Ontario

Where Flyboys Use Their SEA LEGS

Lt. Edward Angel (right), and Capt. Arthur Thomas get ready to drop dummy "Sad Sack" for practice rescue.

Clipping along at 35 mph on Lake Ontario, one of the crash boats starts a visual and radar search.



From left, lookouts A/2C Kenneth L. Shuetta and A/1C Joseph V. Cabino; NCOIC M/Sgt. Joseph L. Steblek.

"Sad Sack" is rescued. Only a dummy, he's as hard to spot as a person and gives the crew experience.

THE Air Force isn't all jet planes, crew chiefs, and air bases. It also has some boats to handle crashes or other emergencies in water. The 34th Crash Rescue Boat Flight, pictured here, covers Lake Ontario. The unit's three boats and twenty-six men maintain a continuous seven-day-a-week alert, responding to emergencies and rushing to the aid of those in distress. A radio station at the Youngstown, N. Y., headquarters provides continuous communication between the boats on missions and can coordinate with any aircraft which may join the search operation. Since the lake is frozen during the winter, operations are suspended from December to April. The boats, which are equipped with radar, can search wide areas in poor weather. Clipping along at thirty-five miles per hour, these crash boats can reach remote parts of the lake quickly. They are sixty-three feet long and powered with two 650-hp engines. Simulated rescue missions are practiced regularly to keep the crews and equipment in top condition. "Sad Sack," a floating, man-sized dummy, is the victim in this serious business. A helicopter takes him to some point on the lake where he is unceremoniously dumped into the water. A radio report from the helicopter starts the boats on a dash to the scene of the "crash." Mr. Sack is located by the crew with the use of binoculars, brought aboard in a litter, given "first-aid" and returned to shore for further help. The helicopter stands by for observations during the mission. Photographs on this page were taken by Edward Gray of Buffalo.—END

T/Sgt. Robert G. Hartz assists in getting Mr. Sack to the dispensary for a check-up after his rescue. He is treated as a human survivor throughout drill.

New Squadrons in Formation Stage

UNITS ARE PLANNED FOR WASHINGTON, NEW YORK, ARKANSAS, OKLAHOMA, AND GEORGIA

Everyone is becoming interested in the **organization of new Squadrons** these days, and the efforts are getting results. On two recent trips, **Edmund F. Hogan,** AFA's Reserve Affairs specialist, has succeeded in laying the groundwork for two new Squadrons. He visited a Reserve flying unit in **Niagara Falls, N. Y.** (*see "The Ready Room," page 135*), discussed plans with the outfit's commander, and the **Niagara Frontier Squadron** has now been officially chartered. In February he went to **Fort Smith, Ark.,** with **Maj. Gen. Winston P. Wilson,** Chief of the Air Force Division, National Guard Bureau, and came back with the charter application for still another new Squadron.

Harold C. Stuart, a Director and past National President of AFA, came up with an idea for a **Jet Age Conference in Tulsa,** but there was no AFA Squadron to handle it. Mr. Stuart has taken steps to organize a unit there, and the Squadron is well on the way to formation now.

Hillford Wallace, formerly an AFA Vice President in **Spokane,** decided that it was high time his city was represented on the AFA map, and the charter application has now been received. **Jim Trail,** who heads the Air National Guard in **Idaho,** has taken the necessary steps to see that AFA's **Boise Squadron** is reorganized. He has also visited **Mountain Home,** to see about the organization of a unit there.

Lou Davis, of Deer Park, L. I., N. Y., is calling a meeting there to get a Squadron under way, and plans to utilize the **Flight** method of getting other nearby communities interested in the original Squadron. **Andrew J. Downey,** who was named the Outstanding Reservist in the nation at AFA's 1955 National Convention, is organizing another new Squadron on **Long Island.**

Still another new outfit is being formed in **Georgia**—this one in **Macon,** the home of a very active unit some years ago.

California, with twenty-one Squadrons, still leads the AFA parade, and all the new activity in widely separated parts of the nation is a good sign that the AFA message is being discussed where it's really needed—in communities with no previous airpower interests.

The **Robert S. Hart Squadron** of New Orleans, La., participated in the famed **Mardi Gras** on February 14, with a colorful float designed and built by Squadron members.

(Continued on page 147)

SQUADRON OF THE MONTH

Robert S. Hart Squadron
New Orleans, La.

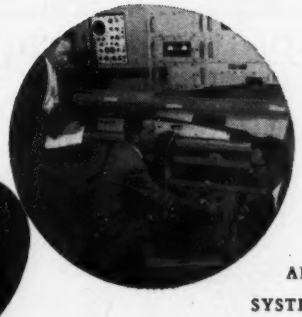
CITED FOR

effectively publicizing the Air Force Association and the 1956 National Convention through the sponsorship of its float in the Mardi Gras parade. This effort represented many hours of work by many Squadron members.

Robert S. Hart Squadron won first prize in the "most unique" division of the Mardi Gras parade, New Orleans, for this float. It was built by the members.

San Francisco Squadron Commander Bob Begley, Col. Wm. Smith, Brig. Gen. A. F. Kalberer, and Tom Stack are shown at Squadron's regular luncheon meeting in January.

Capt. Howard Johnson accepts Boston Squadron recruiting plaque from Commander Ed Shuman. S/Sgt. C. O. Wilson, first recipient of the plaque is at the left (see text).



AIR FORCE, NAVY AND AIRFRAME CUSTOMERS RECEIVE FULL-TIME SERVICE AND INSTRUCTION ON FIRE CONTROL SYSTEMS AND GUIDED MISSILES.

ENGINEERING WRITING

Engineering writers work with research and development engineers during formation stages of new equipment to produce clear, concise technical manuals, for use in maintenance and training, as well as specialized handbooks for USAF aircrews.

Hughes maintains a highly trained organization of expert engineering support to the armed services and airframe manufacturers using the Company's equipment, wherever operational bases or plants are located. Each of the engineers devoted to this work holds a degree in electrical engineering or physics, and is experienced in electronics equipment maintenance or design. These men are assigned to five separate divisions of the department: Engineering Writing, Training School, Field Engineers, Technical Liaison, Field Modification.

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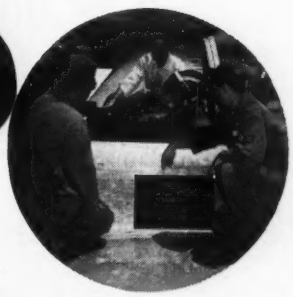
A completely staffed and equipped school is operated to train qualified military and company personnel in maintaining Hughes equipment. Instructors are graduate engineers or physicists with backgrounds in development work or university instruction.

FIELD ENGINEERS

The field engineer works with squadron officers in training maintenance personnel, and in the provisioning of spare parts and test equipment, and provides liaison to the laboratory design groups resulting in continuous product improvement and reliability.



TECHNICAL LIAISON

Engineers are assigned to manufacturers whose aircraft employ Hughes fire control systems, and are responsible for pre-installation testing of the systems. They work with airframe designers in cases where their operational knowledge bears on equipment installation problems.

FIELD MODIFICATION

Hughes policy is not only to get reliable equipment into the field promptly and in sufficient amount, but to modify and develop this as soon as field information and test data become available. Engineers correlate information from the field and indicate engineering changes to the Research and Development Divisions.

ENGINEERS AND PHYSICISTS

If you feel that you are qualified for any of the above positions, send us your resume and qualifications.

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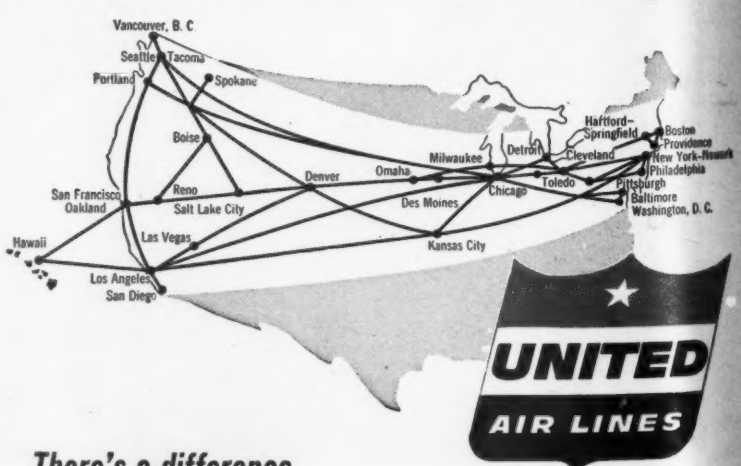

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when you travel in the Mainliner® Manner

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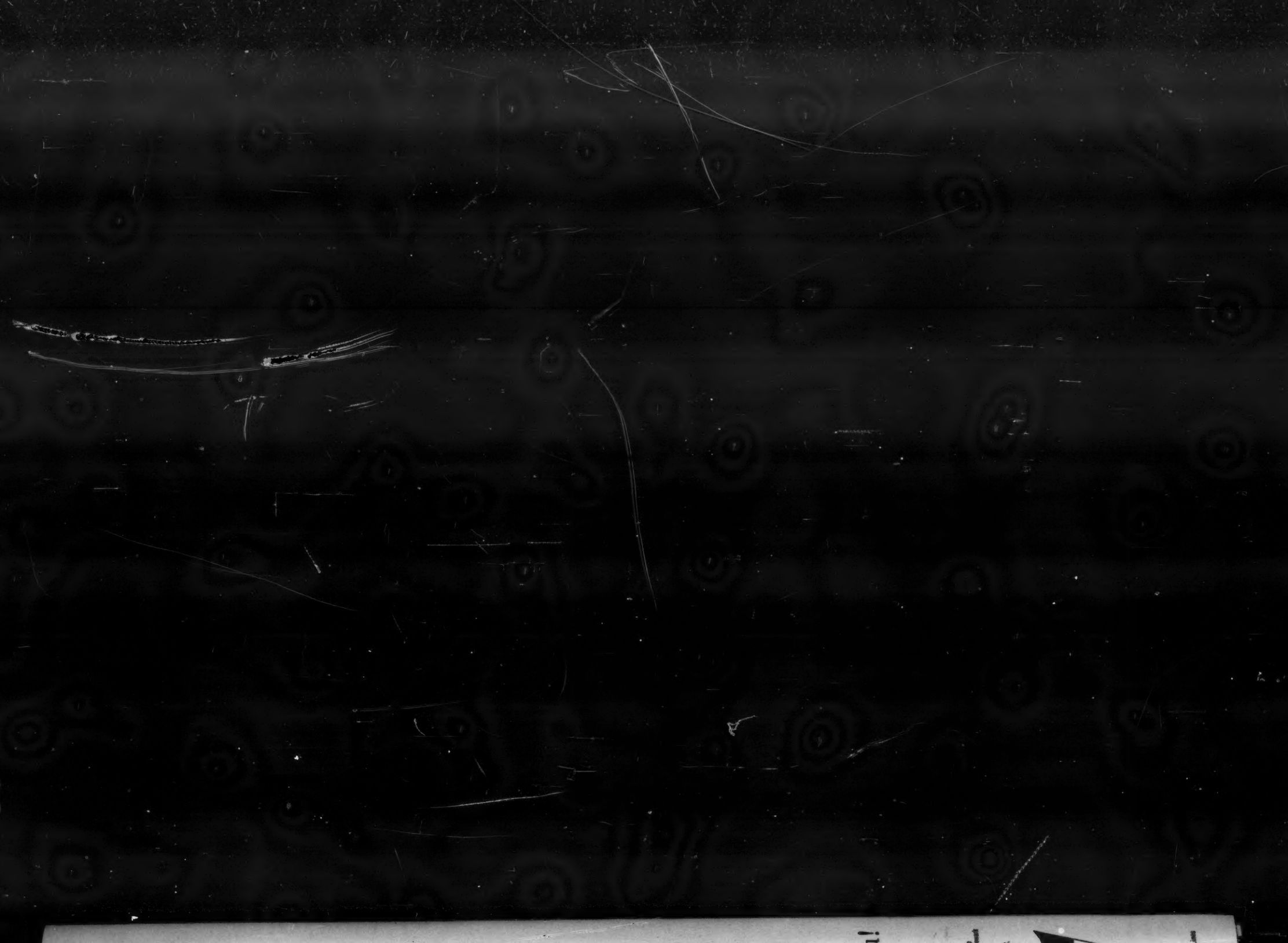

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AIR

One feature of the float was a **large scale model of the Convair F-102,** mounted on a "cloud." Members of the unit, dressed in "space suits," rode on the float, tossing **"flying saucers"** to the crowds lining the parade route. The "saucers" were silver-dollar-sized discs with the AFA insignia on one side, and an invitation to attend the 1956 Airpower Panorama on the other. The float was judged a division winner, and a trophy was presented to the Squadron for having the most unique entry.

The **Jet Age Conference in Washington**—one of AFA's most successful projects—is being carried to the communities all over America. At last

M/Sgt. Harold Neal receives a citation from Frank Keith, Shreveport AFA Squadron. Neal had the highest average in Second AF's NCO Academy.

count, six Wings and three Squadrons were planning their own conferences, using the same idea, and assisted by a kit furnished by National Headquarters outlining a program to be sponsored.

The **Maryland, California, Illinois, Pennsylvania, Wisconsin, and New York Wings,** and the **Tulsa, Miami, and Santa Monica Squadrons** are planning conferences, and discussions indicate that many more of these programs are going to be held. The Washington conference *(see page 131)* was attended by more than 1,500 people, but the surface of the problem has merely been scratched. Communities all over the country need this type of program, sponsored by AFA Squadrons and Flights. If your unit would like to take on this program, AFA Headquarters is ready to give assistance.

The **Illinois Wing,** under the direction of **Commander Donald Spoerer,** has organized a **"Speaker's Bureau,"** made up of individuals in the Chicago area who appear before groups interested in the airpower message.

Illinois Wing Commander Don Spoerer, back row, left, heads a new program set up to furnish airpower speakers to area organizations. Here he is shown at a January meeting of the Men's Club at Chicago's Faith Lutheran Church.

Recently, at the **Faith Lutheran Church** in Chicago, Spoerer headed a three-man speaker's team addressing the Men's Club. **Morry Worshill,** a National Director, arranged the program. In addition to Spoerer, the speakers were **Maj. Al Friedman,** Illinois Ground Observer Corps Coordinator, and **Lt. Col. Clarence Beaudrot,** Professor of Air Science at Northwestern University. In addition, the color film "Target: Nevada" was shown.

(Continued on page 150)

There's a Career for you as a **TWA** Co-Pilot

IF YOU ARE . . . from 22 to 28 years of age; between 5′ 8″ and 6′ 2″; and are in good health.

IF YOU HAVE . . . 500 hours solo or command pilot time; a CAA Commercial Certificate and sufficient instrument time to qualify for Instrument Rating; two years of college or equivalent; a Radiotelephone Permit . . . and can pass TWA physicial examination.

YOU CAN . . . start to fly as a pilot right away! Your company seniority as a pilot starts on your first day and you begin drawing full pay from the first day of training.

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Municipal Airport — Kansas City, Missouri

We'll see you in Old New Orleans at

AFA's 1956

National Convention

AND

Airpower Panorama

New Orleans

August 1-2-3-4-5

CONVENTION SCHEDULE

THE artist's drawing of old New Orleans, below, is only a bird's eye view of what everyone attending AFA's 1956 National Convention and Airpower Panorama will see. A quick look at the Convention program to the right will give you an idea of what is in store. These events, plus the natural entertainment of old New Orleans, make attendance at the AFA meeting a must on your 1956 travel calendar.

Fred Rudesill, AFA Wing Commander for Louisiana, has been named General Convention Chairman by Gill Robb Wilson, President of AFA. Fred already has the historic city pledged to making this the best and biggest get-together in AFA's ten-year existence.

The fact that all exhibit space in the block-square Municipal Auditorium and all suites at the Roosevelt Hotel have been reserved for more than a month, is a good indication of the interest in AFA's 1956 Convention and Panorama. If you haven't already made your reservations, we suggest that you do so right away. There is no telling how soon the other hotel accommodations will be taken. The Roosevelt still has a few regular rooms left. See you in New Orleans!

WEDNESDAY, AUGUST 1

8:00 AM- 8:00 PM: Registration
1:00 PM- 5:00 PM: Reserve Forces Seminar
2:00 PM- 4:30 PM: Industry Briefing

THURSDAY, AUGUST 2

8:00 AM- 8:00 PM: Registration
9:00 AM-11:30 AM: Industry Briefing
12:30 PM- 2:00 PM: USAF-Industry Luncheon
2:30 PM- 5:30 PM: First AFA Business Session
6:30 PM- 9:00 PM: Panorama Preview, Recept'n.

FRIDAY, AUGUST 3

8:00 AM- 8:00 PM: Registration
9:00 AM-11:30 AM: Airpower Symposium
10:00 AM-10:00 PM: Airpower Panorama
12:30 PM- 2:00 PM: Symposium Luncheon
12:30 PM- 2:30 PM: Ladies Fashion Luncheon
2:30 PM- 5:30 PM: Second AFA Business Session
6:30 PM- 8:30 PM: Anniversary Cocktail Party
9:30 PM- 1:30 AM: Wing Ding Mardi Gras

SATURDAY, AUGUST 4

8:00 AM- 5:00 PM: Registration
9:00 AM-12:00 N: Third AFA Business Session
10:00 AM-10:00 PM: Airpower Panorama
2:30 PM- 5:30 PM: Final AFA Business Session
7:30 PM-10:00 PM: Airpower Awards Banquet

SUNDAY, AUGUST 5

9:30 AM-12:00 N: Airpower Brunch
1:00 PM- 6:00 PM: Airpower Panorama

REGISTRATION FEES

REGULAR	$20:	Active, Service & Associate Members.
LADIES	$20:	Auxiliary Members & Lady Guests.
NON-MEMBERS	$35:	May join for $5 then register for $20.
INDUSTRIAL	$35:	Those attending Industry Briefings.

NOTE: *Regular, Ladies,* and *Non-Members* include attendance at all events on program, except Industry Briefings and USAF-Industry Luncheon. *Industrial* includes attendance at all events on program.

AFA MEMBERS—SEE PAGE 11 FOR DETAILS ABOUT ROOMS AT AFA'S 1956 CONVENTION.

"Here's how you can become a United Air Lines' FLIGHT OFFICER!"

If you can meet the requirements below, write for new booklet that outlines career opportunities as a United Air Lines Flight Officer.

Requirements: a commercial pilot's license with 165 hours or more (no multi-engine time required); a U. S. citizen and a high school graduate between the ages of 21 and 30; between 5 ft. 7 inches and 6 ft. 4 inches in height; and able to pass a flight physical without waivers. Applicants with C.A.A. instrument rating or flight engineer examination written portion passed will be accepted through age 31; with Instrument rating and superior flight qualifications through 32. Successful applicants attend United's Flight Training Center at Denver; receive pay while training.

Excellent pay...you get $485 a month as soon as you go on line duty. Your pay increases, too, at regular intervals.

Many extra advantages, too, as well as good pay and rapid advancement. A broad insurance program, retirement income plan and other benefits.

Plan your future now! United's continuing growth will maintain the need for qualified men for years to come. Send for booklet today.

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Stapleton Airfield, Denver 5, Colorado

Please send me your booklet that tells me how I can become a Flight Officer with United Air Lines

Name.....

Address.....

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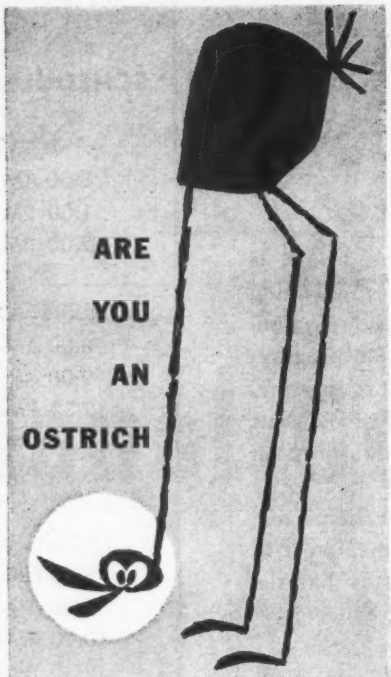

. . . when it comes to cancer?

Do you bury your head in the sand and hope it won't attack you or someone close to you? Fight cancer with a check-up to protect yourself and a check to help others.

Give to your Unit of the American Cancer Society, or mail your gift to CANCER, c/o your town's Postmaster.

AMERICAN CANCER SOCIETY

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AFA NEWS—CONTINUED

Col. O. B. Johnson, Commander of O'Hare AFB for several years, has been a real friend of the Chicago Squadrons. During that time on a number of occasions he and his personnel have helped make AFA programs more successful. There was many an "Auld Lang Syne" sung in January when AFA in the area held a farewell party for Colonel Johnson, and presented him a plaque in appreciation of his contributions. **George Anderl,** a National Director, made the presentation. Colonel Johnson is being transferred to Air Defense Command Headquarters at Ent AFB, Colorado Springs, Colo.

The **Boston Squadron** has come up with an idea to help spur the **reenlistment of prior-service airmen.** Although the recruiting stations are usually able to meet their quotas of new recruits, the Air Force has a pressing need for the **skilled technicians** who are already trained and can step right back into their USAF specialty.

Boston AFA members **have furnished a plaque** which goes to the airman who signs up the most prior-service personnel each month. The plaque was presented to **Capt. Howard Franklin,** of Recruiting Detachment 109, by **E. L. Shuman,** Boston Squadron Commander.

S/Sgt. Charles O. Wilson was the first to have his name inscribed on the new award, and in addition received a personal gift from the Squadron.

Eric Rafter and **Charles McCann,** South Bay, Calif., Squadron members, have been appointed District GOC Supervisor and Assistant Civil Defense Director, respectively.

The **California Wing** will hold its convention this year in **Long Beach,** at the Hotel LaFayette, on **April 20-22.** Here are a few of the highlights.

A **"mixer"** will be held on the night of the 20th, following the first business session. On Saturday—in addition to business sessions, the Airpower Luncheon, and the ball—a four-hour **Jet Age Conference** is planned.

The convention will wind up Sunday at noon, after the election and installation of new officers. **Charles O. Morgan, Jr.,** San Francisco, is Wing Commander and in charge of the convention. He has named **Miss Joanne Affronte,** a member of the 1st Reserve Squadron of Long Beach, Convention Chairman.

John R. Alison, AFA's Board Chairman, will head a roster of guest speakers, which will also include Executive Director **James H. Straubel.**—END

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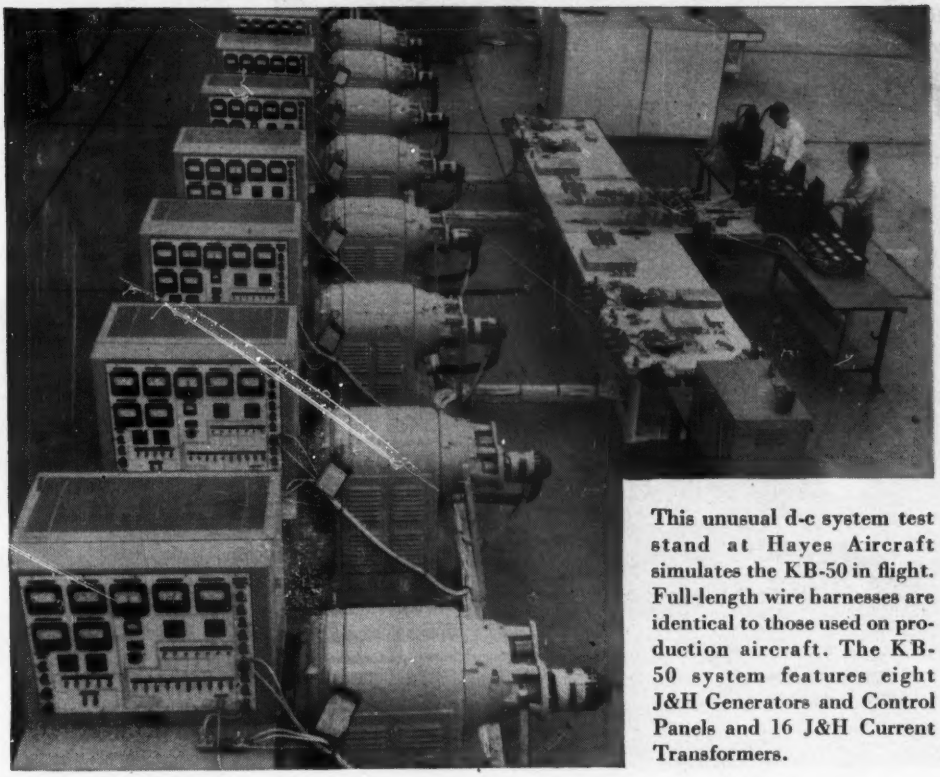
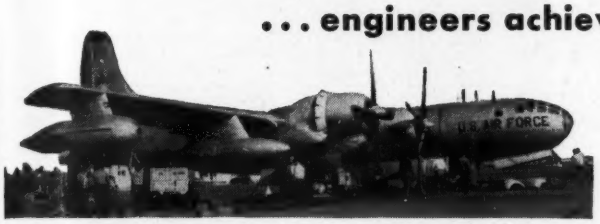


This unusual d-c system test stand at Hayes Aircraft simulates the KB-50 in flight. Full-length wire harnesses are identical to those used on production aircraft. The KB-50 system features eight J&H Generators and Control Panels and 16 J&H Current Transformers.

Jack & Heintz Generators paralleled in unique d-c system!

... engineers achieve 78% more power for KB-50



The KB-50 will have tremendous refueling capacity. Plans call for fueling of three planes simultaneously.

In converting the Boeing B-50 Superfort into the KB-50 mid-air refueling tanker, a substantial power boost was needed to drive the array of rapid-transfer fuel pumps honeycombed throughout the plane.

The approach lay in developing a new higher rated generator or in paralleling eight available 400-amp machines.

The Jack & Heintz G23 d-c Generator proved to be the answer. Rugged enough to withstand the high vibration characteristics in the KB-50, this generator required only a specially machined housing and a modified mounting flange.

Through the use of the G23, Hayes and Jack & Heintz engineers have achieved a power supply of 3200 amps in the same available space once yielding a maximum of 1800 amps. The unprecedented paralleling of eight generators has been test-proved completely reliable.

Also available is a modified G23 with an increased rating of 450 amps, which is ideally suited to airline applications.

For complete information, write Jack & Heintz, Inc., 17634 Broadway, Cleveland 1, Ohio. Export Dept.: 13 E. 40th St., New York 16, N. Y.

Jack & Heintz G23 Generator

Rating—amp	400
Voltage—d-c	30
Speed Range—thousand rpm	3.8-8
Weight—lb	67
Dimensions—inches	
Over-all Length (from mounting flange)	13 3½
Over-all Diameter	8
Bolt Circle Diameter	5
Spline, Pitch Diam	.8
Air Inlet Conn., OD	3
Cfm of Air at 6" H_2O & 6000 rpm	165
Rotation as Viewed from end Opposite Flange	CW

©1956 by Jack & Heintz, Inc.

JACK & HEINTZ *Rotomotive* AIRCRAFT EQUIPMENT

British Civil Defense Corps members practice a rescue.

Center: Damage can be recorded on scale maps. Below: Cables are laid during an exercise.

An ambulance arrives on the scene for a practice emergency.

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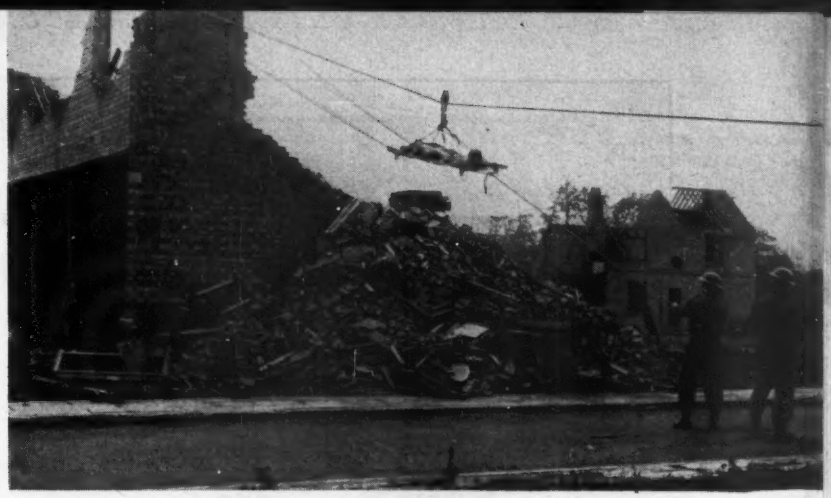
BRITISH INFORMATION SERVICES



Lines are used to rescue a victim from the top of a blitzed building.

In Britain they take

another look at Civil Defense

By Prof. Norman Gibbs

TWO ASPECTS of the present state of civil defense in Britain call for comment. Both arise from the revolution in strategy caused by the H-bomb. The first is that the vast scale of thermonuclear explosions, and the problems of the fall-out in particular, have compelled the government to reexamine basic assumptions about the best ways to protect civilian life during war. Secondly, this reexamination has begun to introduce a closer mingling of civil defense and home defense, of the tasks of the civilian and the soldier.

The first general government statement on the catastrophic blast and heat effects of an H-bomb explosion, and upon the connected problems of radioactive fall-out, was made in the annual "Statement on Defense" of February 1955. It is clear that Sir Winston Churchill, then Prime Minister, was unwilling to encourage either widespread talk about the H-bomb, or about measures to counteract it, until the government departments concerned had had more time to come to some agreement about possible remedies. Sir Winston's line has been followed by his successor. As a result we are still waiting for a detailed account of how the government proposes to protect civilians, both in their homes and in industry, and it is clear that we are not going to have that account at least until this year's "Statement on Defense," or perhaps even later.

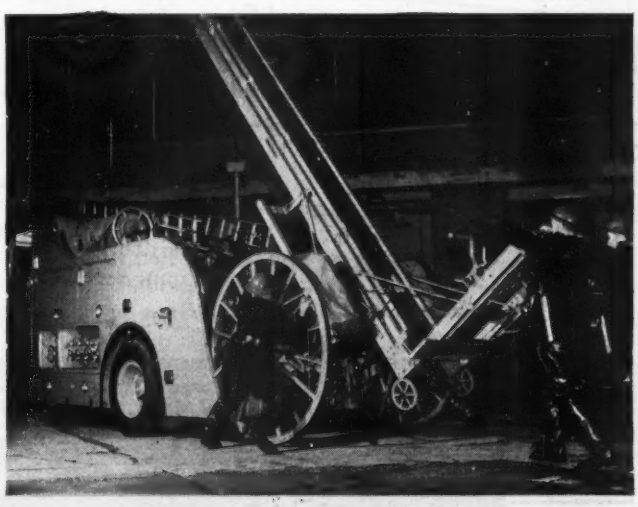
It is easy to criticize this attitude. On other occasions complacency has proved to be our national weakness, and its price has been high. Undoubtedly, the British public has so far failed to appreciate sufficiently the significance of the H-bomb, largely for lack of authoritative instruction. In a leader [editorial] of last September, the [London] *Times* complained that many businesses were losing interest in civil defense simply because nobody in authority would tell them what would have to be done in war and therefore what preparations could reasonably be made in peace.

On the other hand, there are some strong arguments on the side of the government's attitude of cautious delay. In the first place, Britain has no direct experience of thermonuclear explosions and must depend upon the United States for information. Secondly, ignorance is not necessarily worse than confusion. There is a good deal to be said for silence until we can all speak with the same voice.

Thirdly, no protective measures will be cheap, and there is everything to be said for spending money only after due consideration.

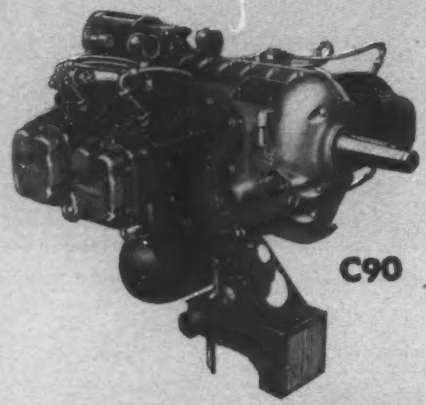
The government has replied to critics of this policy of delay by saying that it is attempting to "steer a realistic course between hysteria and inertia." A fair summing up of the present position is that hysteria has quite certainly been avoided. Inertia will, equally certainly, be the price

(Continued on page 155)



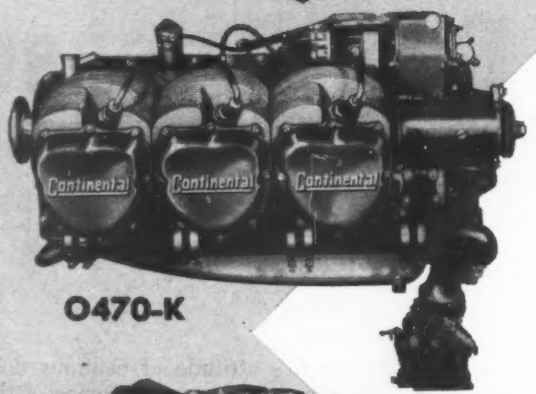
Auxiliary Fire Service recruits, undergoing training to prepare them for active war service, use a pump escape.

CONTINENTAL MEANS DEPENDABLE POWER

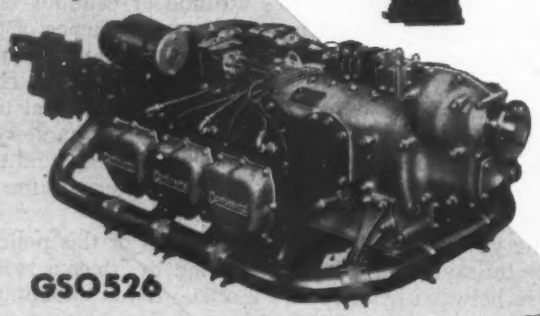


C90

. . . PLUS THE BACKING OF ESTABLISHED AND EXPANDING SERVICE



O470-K



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we shall pay unless the government makes up its mind about protective measures and announces them soon. There has been enough waiting.

In fact, it is quite easy to read between the lines and forecast some features of the policy still to be announced. In the first place there *is* going to be a plan for civilian defense. There is no intention of throwing up our hands and letting fate take its course. Official statements have repeatedly affirmed that details *will* be announced.

Moreover, public anxiety over this policy of deliberate delay has arisen from a desire to get on with the job. Coventry has had no imitators in its claim that civilian defense against the H-bomb is impossible. Secondly, dispersal and evacuation will remain fundamental to our civil defense plans in the future as in the past. All plans for civilian defense rest on the assumption that organized communities can remain organized, at any rate in some degree, even in a thermonuclear war.

The main problem, therefore, is to remove non-essential personnel from likely target areas. Moreover, the evacuation conception in turn rests on the assumption of a pre-war warning period, and our plans will certainly continue to make that assumption. Further, it is clear that the slow but steady dispersal of industry which has been going on since World War II will continue to be encouraged by the government. The distinction between evacuation, neutral, and reception areas will be far less easy to make than in the past, for the effects of fall-out will be felt over wide areas and the relative safety of rural areas correspondingly reduced.

Thirdly, shelter policy has previously been the corollary of evacuation. But Britain has very few natural features—unlike Sweden or Switzerland—which can be cheaply adapted for underground shelters. A major shelter policy over here might well cost 2,000,000,000 pounds or more. We have already had an emergency budget this financial year, and one of its major purposes was to cut capital expenditure. There can be little doubt that the government's shelter policy will seek to provide shelters through the adaptation of existing buildings as cheaply as possible. We have already been told what no one can reasonably doubt, that the best way to prevent nuclear war is "by providing and maintaining a sufficient deterrent." Who, then, can doubt that the V-bomber force [Britain's SAC], rather than deep shelters, will get whatever money there is to be spent?

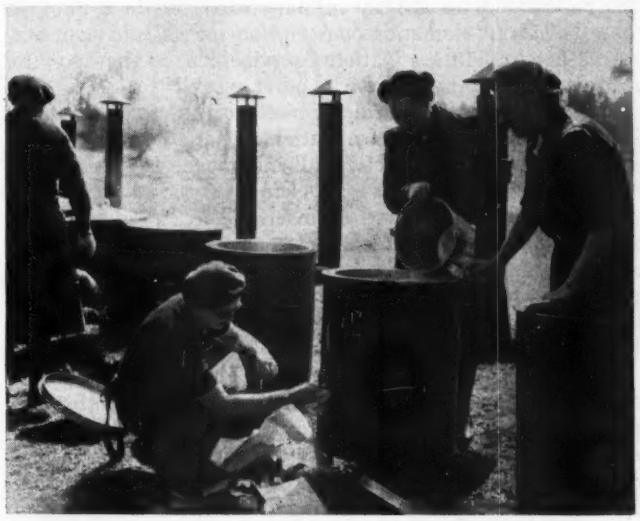
Whatever uncertainty there may be about exact methods, there can be no doubt that, in Britain, we have decided to make civil defense the joint responsibility of civilian and military authorities in the future. This is an administrative revolution, and a minor strategic one as well. In World War II civil defense was the job of civilians looking after civilian welfare. Home defense was a different job—the military job to prevent invasion either from the air or from the sea. But in the nuclear age civil defense and home defense are the same. In the first place, defense against nuclear weapons would demand the cooperation of every available adult, soldier and civilian alike.

Secondly, we are working more and more on the assumption that "the concept of reserve forces to take part in a large-scale conventional war is out of date." Troops in the country on the day the war breaks out will almost certainly stay there and be used there.

Thirdly, in a nuclear war large-scale invasion by air or sea is extremely unlikely, at any rate until command of the air has been won. The old conception of a home-based, anti-invasion army with strictly military tasks is no longer valid; "the primary role of the reserve army would be to help to maintain the life of the nation and to deal with raids and sabotage."

In the 1955 "Statement on Defense," therefore, the government announced that the Army and the Royal Air Force would cooperate with the civilian authorities in planning home defense as a whole. The old conception of separate, independent civilian defense is on the way out; the combination of civil and military authorities within the wider conception of home defense will increasingly take its place. But—and this is an essential proviso—there is no intention in Britain, either now or in the foreseeable future, of handing over either complete or even final responsibility to military authorities in such matters. Civilians will continue to play not merely a part, but a very large part in home defense. And where authorities must combine for these purposes there is still, as there always has been in this country, a clear intention that the civilian shall have the last word.

Let us see how the new plans are intended to work. On the civilian side the picture is virtually unchanged. There is a total of about half a million volunteers in the various civil defense services—the Civil Defense Corps, the Industrial Civil Defense Service, the Auxiliary Fire Service, and the National Hospital Service Reserve. Two qualities of this sort of work should be noted. It is voluntary, and it is based on intimate acquaintance with local



Women's Voluntary Services members of the Welfare Section of the Civil Defense Corps light the boilers of a mobile canteen during a training exercise. In an emergency, they will serve as auxiliaries to the Civil Defense Corps.

conditions. In the near chaos of severe bombing, as we discovered in World War II, the civil defense warden who knew not only the streets in his area, but the houses and the people who lived in them, was not only first on the spot but essential as a source of information in rescue, ambulance, and welfare duties. What is too easily lost sight of is the importance of welfare work on the civilian side of home defense. Its value is obvious when people are bombed out and need food and shelter. But it is equally great in planned evacuation which, as we have discovered once already, can give rise to major social problems.

Here the contribution of the Women's Voluntary Services would be of great value. The WVS has a long tradition of welfare service, in peace and war. In war the WVS would put civil defense work first, would help with settling

(Continued on following page)

evacuees, running canteens, providing clothing, and a whole host of equally unimpressive and equally vital tasks.

The Observer Corps is another volunteer organization with an essential task. In World War II the volunteer Observer Corps maintained a round-the-clock watch on all aircraft in the skies over Britain and formed a vital link in our warning system. Now it has taken over a national monitoring organization to give warning and measure radioactivity in the event of air attack.

Most of these voluntary bodies have peacetime work to do which preserves enthusiasm. The one organization without such a peacetime counterpart of its wartime work is the Civil Defense Corps, the Air Raid Wardens. Unless the government decides on its plans soon and announces them, this part of the voluntary civilian set-up is likely to suffer most.

On the military side everything is newer, smaller, and still experimental. It is recognized that local voluntary services would not be sufficient in a nuclear war. They would have "to be supported by all the formed and disciplined bodies of the armed forces that were available in this island." More specifically, since conscription robs the civilian services of precisely the active, strong young men it needs for dangerous, heavy work, then the armed forces who conscript those men must make some of them available for home defense duties. The opportunity arose from the assumption that reserves of mobilizable manpower will not be wanted for strictly military functions in a nuclear war. The Army demands conscription for its cold war, not for its hot war duties. National servicemen, as they go into reserve, can be transferred to other work.

All members of the armed forces are now to be trained in elementary civil defense duties as part of their normal military training. In practice, all this means is that a large number of men will have an elementary idea of how to protect their families and themselves on the spot. Every successive Army announcement makes it clear that most national servicemen will have no active reservist operational role. On demobilization they will become and remain civilians, and any home defense work they do will be done in a civilian capacity.

So far this amounts to very little. The important developments are taking place on a far smaller scale. In the first place the Royal Air Force is to provide 10,000 reservists each year—men whom it wants for their two-year period of national service but not for the reserve—to be given specialist training in fire-fighting duties. The civilian and voluntary fire services are not able to provide enough men of the right age for the job to be done in a nuclear war when fire and devastation would be on an unprecedented scale. The RAF men are given four weeks of training at the end of their period in uniform and a further period of specialist training during their first year in the reserve. Already one large training establishment is in operations at Chorley, in Lancashire, and another, for advanced training, is to be opened in Gloucestershire this year. The work is being done under joint Air Ministry and Home Office auspices and has proved, however small its scale so far, remarkably successful.

Secondly, there is in process of formation a Mobile Defense Corps. This is to consist, initially, of forty-eight reserve battalions, each with a strength of about 600 men. The intention is that the Mobile Defense Corps will be trained in fire-fighting, rescue, and ambulance work, will be mobilized at need, like a normal reserve military force, and will be distributed over the whole country. They are, in fact, to be shock troops for heavy, dangerous work, to be used as a central emergency reserve for dispatch to wherever they are most needed. These men, like the RAF reservists, will receive a period of training while on active service and further training when posted to the reserve. Recent announcements of curtailed reserve training will not, in fact, make any practical difference to this scheme.

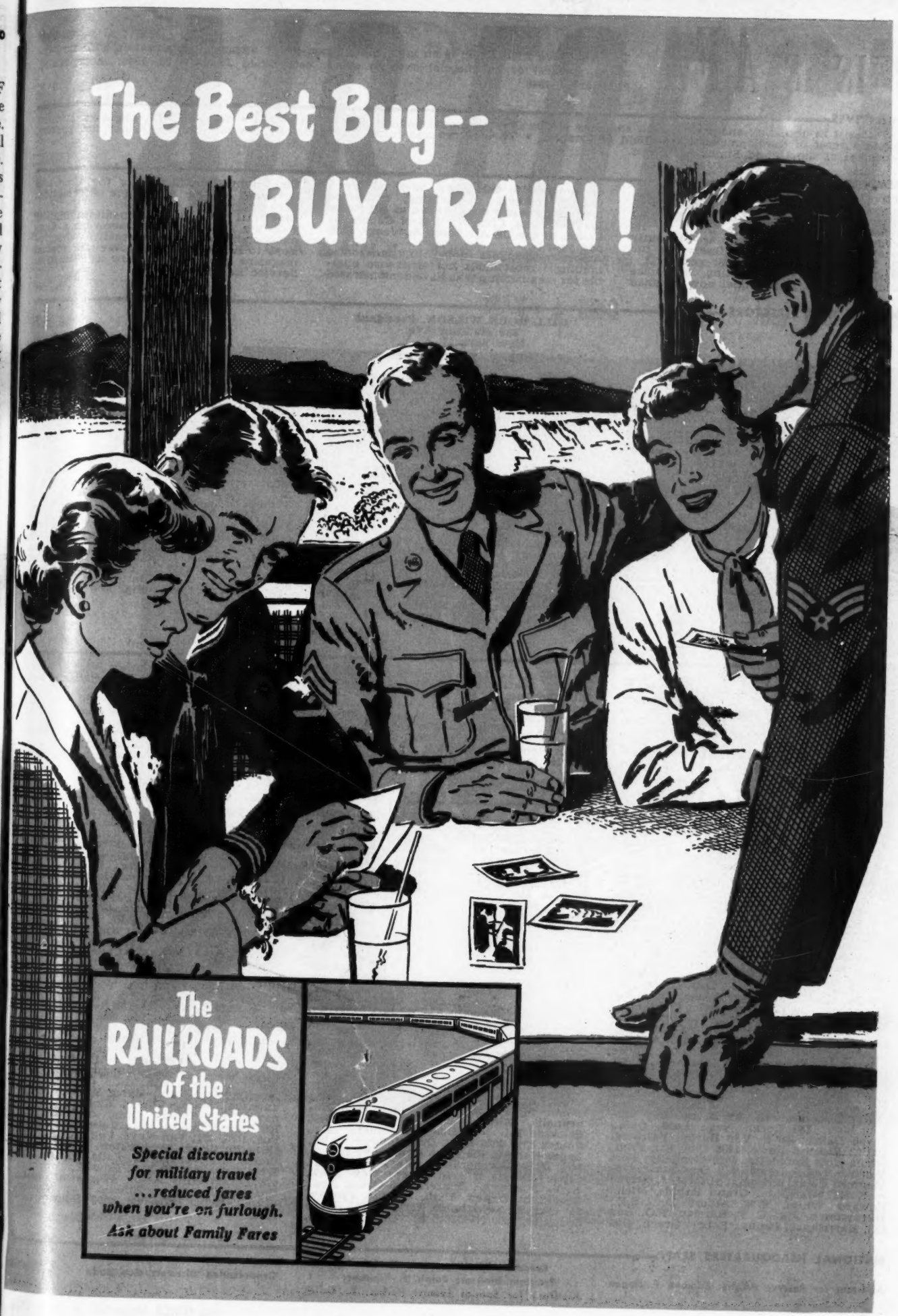
General responsibility for the Mobile Defense Corps will rest with the War Office, although some of the battalions will be raised by the RAF. On mobilization the battalions of the Corps "would come under the operational control of the local Army commander who would deploy them in consultation with the civil defense regional authorities." This is a rather more complicated scheme than that of the RAF fire-fighting reservists, and it is still too early to say how it will work. Some exercises have been carried out already; but it would be unwise to praise or criticize until the more extensive exercises planned for the coming spring have been held.

What of the future? Two thoughts suggest themselves. Firstly, if the present plan of combined civil and military contributions to Home Defense is to continue, then some system of agreed interlocking command must be worked out as a high priority. The Prime Minister has said the government is well aware of this need and that the newly appointed Commander-in-Chief, Home Forces, would look upon it as one of his primary concerns. The Home Office has over-all responsibility for the civil side of Home Defense. It has already appointed Regional Directors of Civil Defense for the eleven Civil Defense Regions of England and Wales. These directors, many of whom are retired military officers, are expected to establish liaison with Army commands.

Secondly, is the present plan good enough? This is a much more difficult problem. Assuming a state of war in which central administration and services are impossible to maintain, then defense becomes local defense. To that extent we are right to have made civil defense—under the Home Office—the business of local government authorities. Moreover, no one who knows the pattern of social life in Britain would underestimate the value of voluntary work in welfare services. But this sort of war, if it comes, will be far nearer chaos than anything we have known before. Will not the discipline and cohesion of military forces then be the prime necessity? Can we, in fact, afford to entrust the first-line defense of the home base to forces any less trained and disciplined than those whose duty is to bomb the enemy? At the moment there is no real evidence that this view has any support in the government, or much outside it. The present plans, whatever they appear to be, are not really a substantial concession to this point of view. Indeed, we are already throwing away a chance to combine local knowledge and enthusiasm with military training in our progressive disbandment of the Territorial Army and the Home Guard.

Home defense in the future will be something quite different from anything we have known in the past. In this country we prefer to try to solve even revolutionary problems by conservative methods—a by-no-means negligible quality of our national genius. But even if we move steadily as well as slowly, we will not solve this problem until we admit that service in home defense is now as much a soldier's job as driving a tank or flying an airplane. But, if that is so, how long can our present, mainly civilian, organization continue? The logic of deterrence surely must be that full military home defense is the inevitable corollary of determination to use the bomb.—END

Professor Gibbs is Chichele Professor of the History of War, All Souls College, Oxford University, England.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